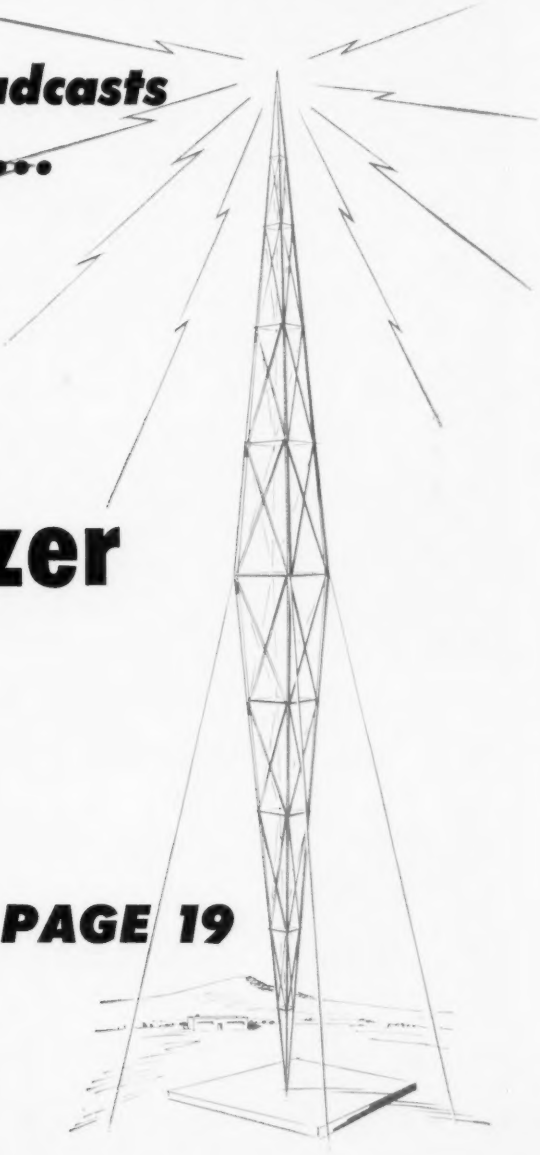
APRIL, 1958

Commercial Fertilizer

and PLANT FOOD INDUSTRY

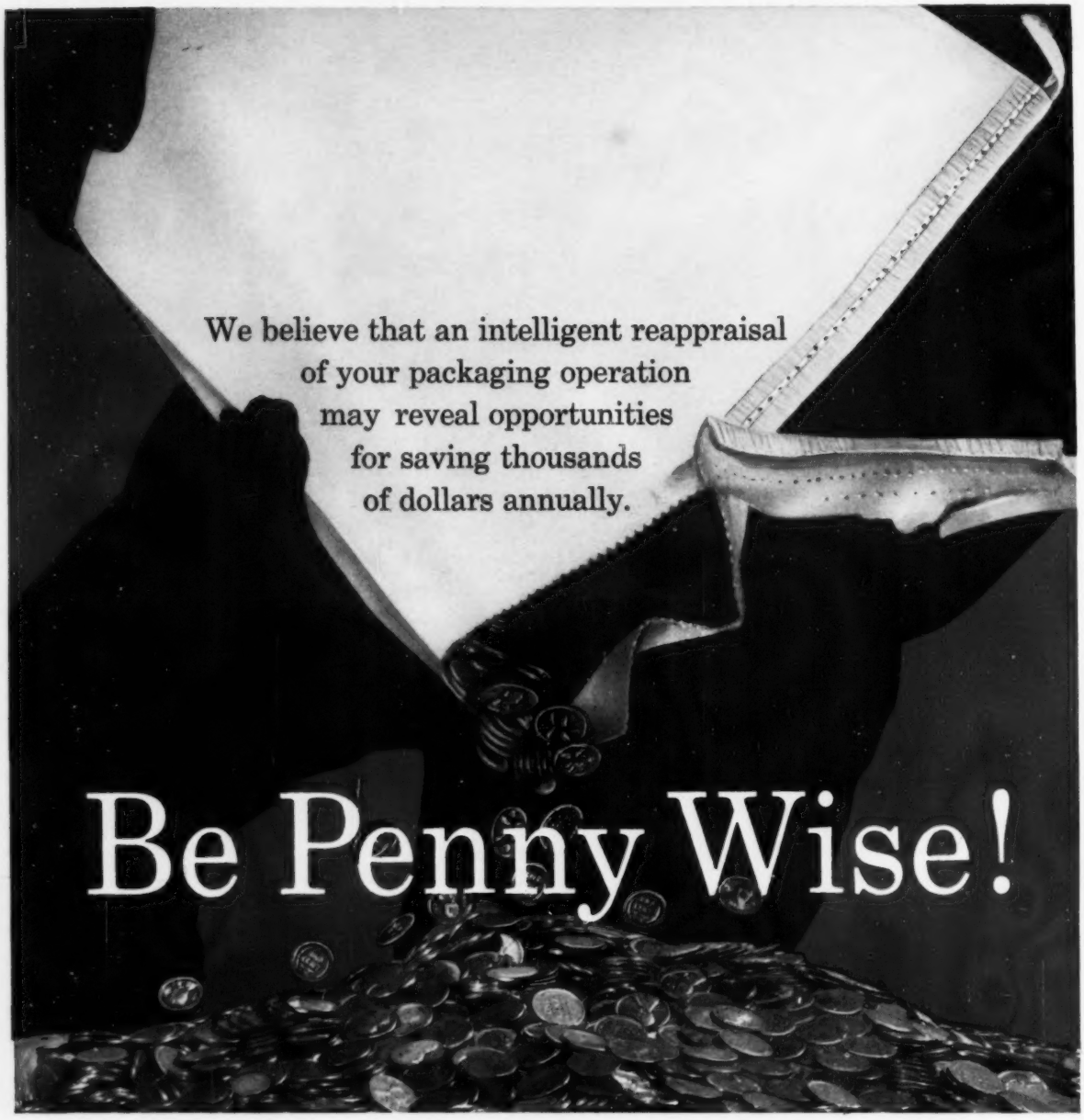
Nitrogen Division Broadcasts to Millions of Farmers...



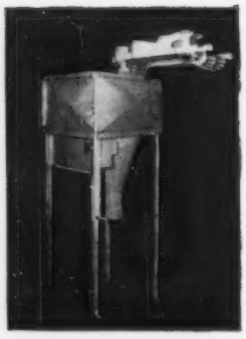
Buy Your Mixed Fertilizer *NOW!*

SEE PAGE 19

Advertisement of NITROGEN DIVISION, ALLIED CHEMICAL



IN BUYING MULTIWALL BAGS NO SAVING IS TOO SMALL TO IGNORE!



THE KRAFTPACKER Open Mouth Bag Filling Machine, for free-flowing material, automatically saves pennies, too, through higher production and greater accuracy. Requires a lower investment and maintenance cost than any other automatic machine of its type in use today!

KRAFT BAG CORPORATION

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Integrated mills at St. Marys, Georgia and Gilman, Vermont

Exclusive Sales Agents for Kraftpacker

Show me how to save on my multiwall bag packaging.

Gilman PAPER CO.
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• The Coastwise Corp.
• Kraft Bag Corp.

COMPANY.....

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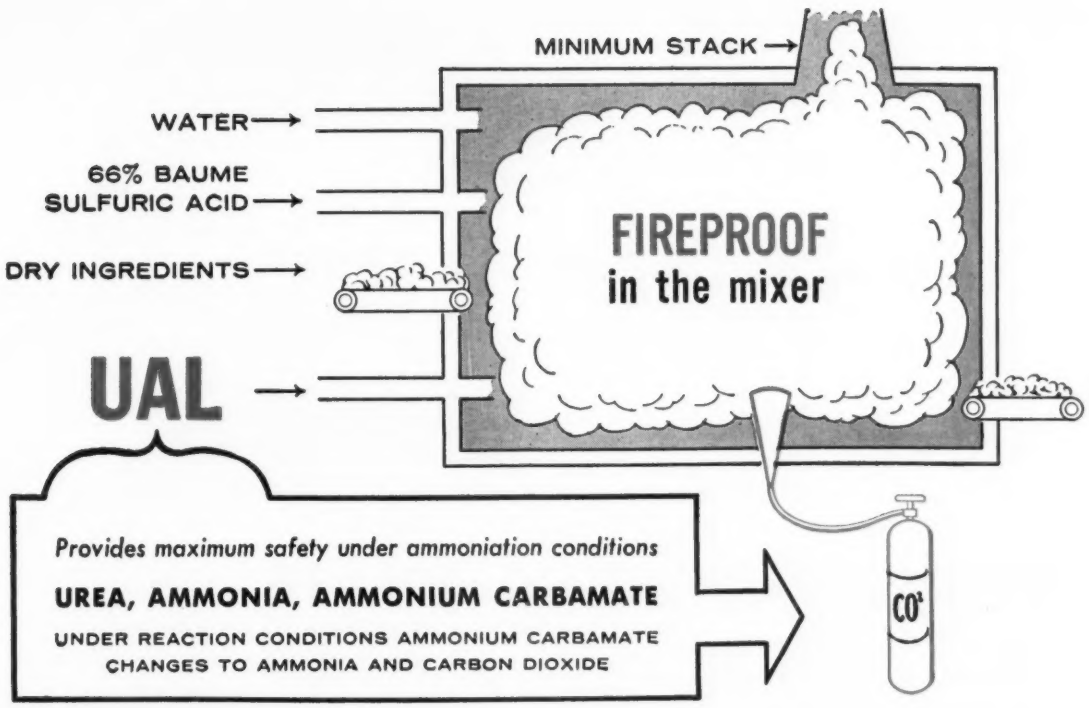
CITY..... ZONE..... STATE.....

PRODUCT MFD.....

NAME.....



Granulating is fireproof with Du Pont URAMON® Ammonia Liquors

Du Pont "Uramon" Ammonia Liquors give you maximum safety in high-temperature granulating by eliminating dangerous flash fires in the mixer; and, further, by assuring safety in the pile.

Fireproof conditions are maintained in the mixer when Du Pont UAL is used. As the ammoniation proceeds, the ammonium carbamate in UAL changes to ammonia and carbon dioxide. Ammonia enters the reaction and carbon dioxide displaces the air, thus creating conditions that guard against combustion.

Four formulations are available . . . all are equally safe for granulating. For technical assistance and information on the solution best suited to your use, write Du Pont.

HERE ARE OTHER IMPORTANT ADVANTAGES OF DU PONT URAMON® AMMONIA LIQUORS:

- High-quality nitrogen from UAL resists leaching . . . supplies both urea and ammonium forms of nitrogen.
- Won't corrode regular fertilizer manufacturing equipment, including ordinary steel and aluminum.
- Gives mixed goods better "feel"—minimizes caking, segregation and dusting.
- Suitable for either batch or continuous mixing.
- Prompt, dependable delivery enables you to schedule your production with confidence.

DU PONT REG. U. S. PAT. OFF. **URAMON®** AMMONIA LIQUORS

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COARSE

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ROP, Granular and Coarse.

TRIPLE SUPERPHOSPHATE

Quality controlled ROP, Granular and Coarse Triple Superphosphate of highest uniform consistency, properly conditioned, ready on arrival for immediate processing.

ONE ORDER AND DELIVERY BRINGS ALL THREE

From the country's largest producer of Triple Superphosphate, your requirements, large or small, are always readily available.

There's a **BRADLEY & BAKER** Office near you. Their representative would be pleased to consult with you on your requirements and to advise on your most convenient delivery routings.

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and PLANT FOOD INDUSTRY

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Commenting Freely

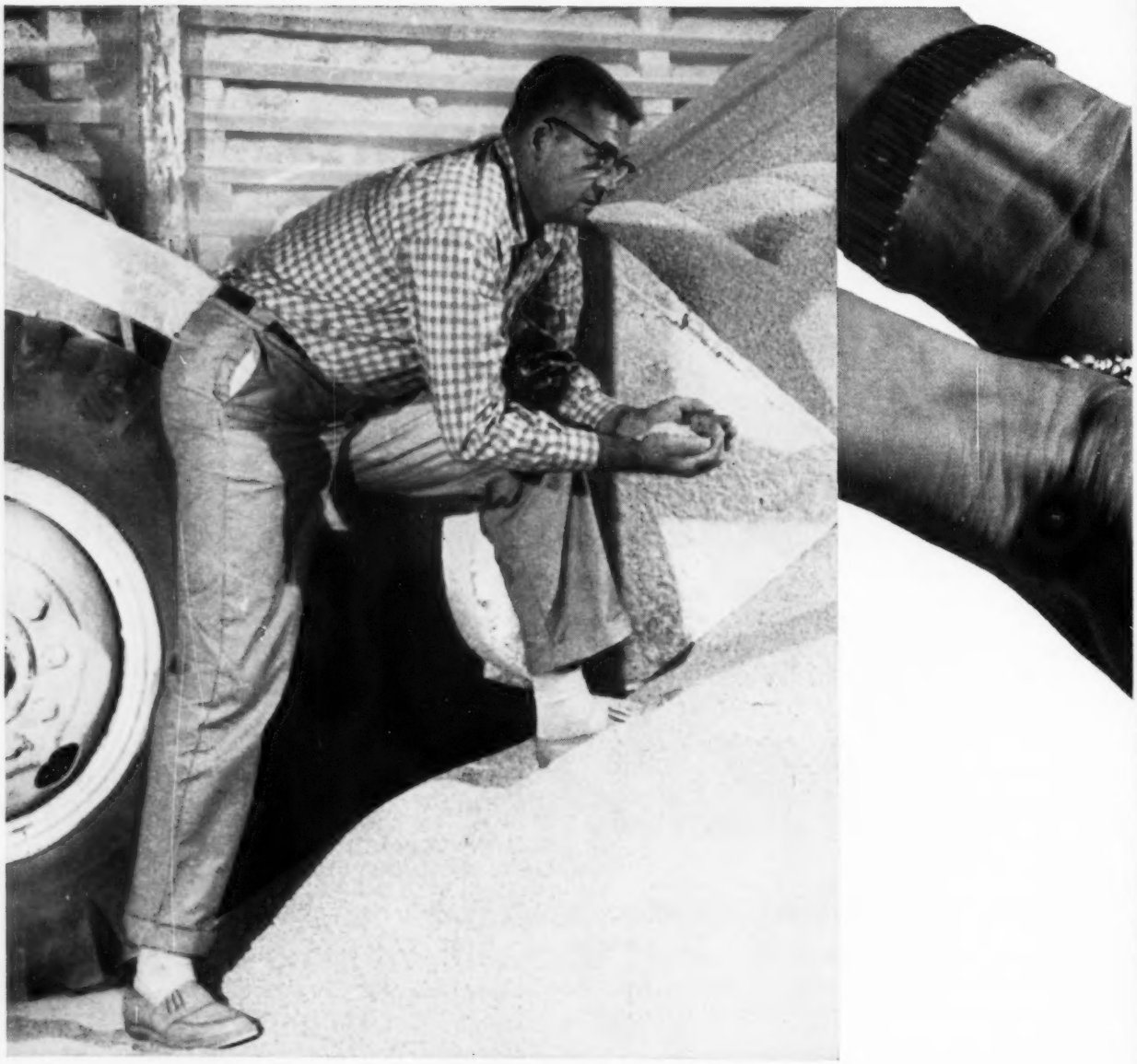
by BRUCE MORAN

There has been a lot talked and written lately about contract farming, as though it were something new. And to some it seems a threat, to others the salvation of agriculture. The truth is, it is pretty old stuff. A lot of crops have long been grown under contract to canners and such. And the whole foundation of the frozen poultry business has been to let the small farmer grow chicks supplied by the packer, who buys them back at his chosen weight.

This gives the farmer a dependable market, an income as sure as possible, definite direction supplied by more experienced, better informed management than he can ever supply for himself. And it helps him over the hurdle of finances.

There is talk that this lowers the farmer's morale—making him some sort of slave, captive, peon. "Vassal" would be more like it, really . . . unless the contractor manages to spread over an area so wide that farmers must bow to his demands or starve, as the pessimists see it. But it would take a pretty powerful contractor to so blanket the broad field of agriculture that there would be no place for the farmer to turn.

It may, at least, save the little farmer for a while.



"Step into the pile anywhere," says Don Peterson, General Manager of the Ashkum Fertilizer Company, "and you'll find every handful of Bumper Crop fertilizer a top sample." Strong demand for the company's granular fertilizers in East Central Illinois and West Central Indiana keeps the plant busy the year round.

Plant Superintendent Chuck Durham watches production closely when plant is "on stream." Good materials here make a good product.

A stop at the granulator shows Clint Serene the mix is right. Full-time local residents provide a highly efficient labor force.

Final check shows uniform pellets coming off the belt. Granulation like this holds recycle to a minimum ... reduces dust problems, too.

"Granulation results prove...

International's Triple Super belongs in our plant"

says General Manager Don Peterson
Ashkum Fertilizer Company, Ashkum, Illinois

Granulation is more than a process at Ashkum Fertilizer. It's the sales-life of the company — for Ashkum sells all mixed goods in granular form.

Granular fertilizers have helped put this small farm community "on the map" during the plant's four years of operation.

The same deliberate care that went into the planning and construction of the modern plant (a William Tyler installation) goes into the selection of basic goods.

"International's Triple Super has earned its place in our plant," says General Manager Don Peterson. "We can bank on its arriving in good physical condition for easy handling. We like the way the triple ammoniates . . . and the uniform pellets that roll off the belts are proof of top granulation."

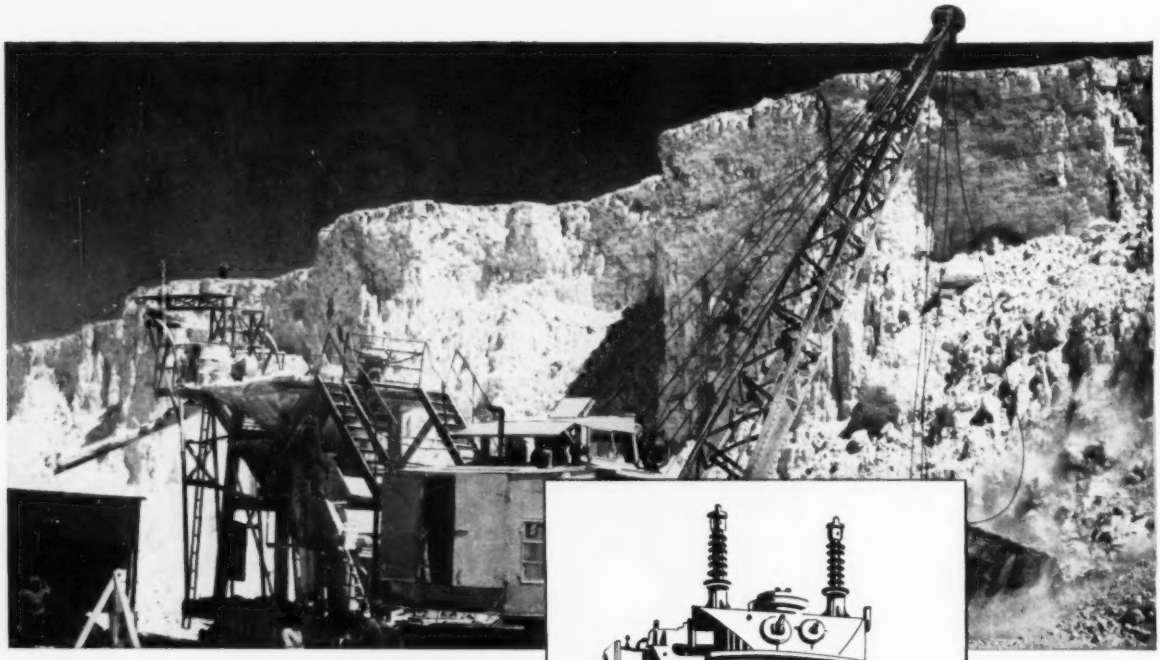
You can benefit from Ashkum Fertilizer's experience. Rely on International for dependable, helpful service and top-quality product. Write or wire for full information.

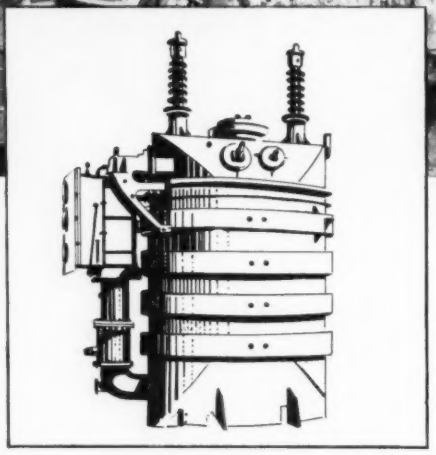
Conveyor belt from bagger loads directly into waiting truck as bagging foreman Glenn Heideman checks weight. Conveyor telescopes to load either front or back of truck.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

PHOSPHATE CHEMICALS DIVISION .... 20 N. WACKER DRIVE, CHICAGO 6, ILL.

SULPHUR *helps to create Headline Products*





SF_6

A new concept in transformer insulation

GAS INSTEAD OF OIL... *that is headline news!*

Sulphur Hexafluoride is a heavy, non-flammable gas and is both chemically and physiologically inert. These characteristics plus its high dielectric strength pin-pointed the heavy duty transformer field as a logical target. And so it turned out!

SF6 instead of oil is now being used in high voltage transformers with the following advantages:

- **operations are much quieter**
- **lighter construction permissible**
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- **lower maintenance**
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In SF6, the electrical and electronics industries are finding a very useful product providing both electrical insulation and cooling. As in so many 'headline' products serving industry, the element S is part of the chemical structure!

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For nearly three-quarters of a century, the philosophy of progressive engineering has made Nordberg a leader in the design and manufacture of heavy machinery . . . as evidenced by the universal acceptance of this machinery by the mining and mineral processing industries. This experience is reflected in the advanced engineering and quality construction of the complete line of dependable Symons Vibrating Screens designed and built for the fertilizer and plant food industry.

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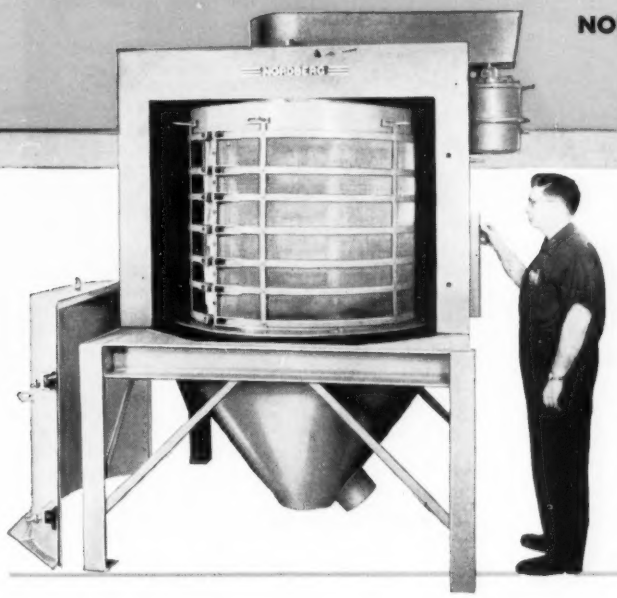
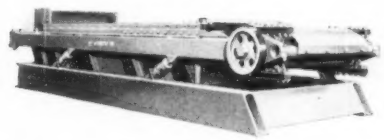


The SYMONS V-SCREEN®

is a new type screen that utilizes centrifugal force, and is specially designed for sizing material in the finer sizes . . . ranging from 4 mesh down to as small as 80 mesh in some cases. The V-Screen requires only 5 hp to operate under full load . . . and is the *only* vibrating screen that does not depend on gravity alone for sizing. *(Write for Bulletin 243)*



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Bulletin 243 gives complete details on the versatile Symons V-Screen. Write for your free copy today.

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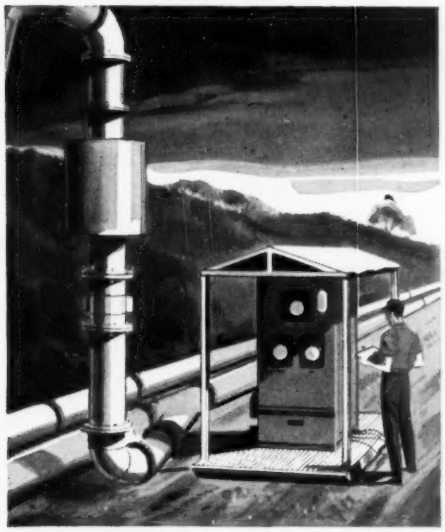

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Uniformity of your phosphate rock starts at the mine pit—where it should. When the slurry feed from the mine reaches the preparation plant at a uniform flow rate and with uniform density, processing of phosphate rock is more efficient. To obtain maximum control of feed flow, *International Minerals* has developed a new electromagnetic flow meter, with a density cell using radioactive emissions, which is clamped on the feed line. It continuously reports flow rate and feed density on recording stations, both at the mine pit and plant. This is only one of the many controls and tests, in plant and analytical laboratory, that guard grade uniformity and quality of *International Phosphate Rock*—from the mine pit to your loaded car. For consistently uniform quality, for prompt deliveries of the grade you want in the tonnages you need, it's good business to depend on *International Minerals* for *Quality-Controlled Phosphate Rock.*

For acidulation . . . for industrial chemicals . . . for direct application to the soil.
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JUST AROUND THE CORNER *by Vernon Mount*

Sensible people are beginning to think back and to count on their fingers. Five or six million unemployed out of a sixty-five million labor force. Compare this with the same five or six million out of the forty or so million labor force of not so many years ago. Percentagewise it is a figure not to dismay us too much. But....

Screams from ardent runners-for-office are building this recession into a real one. How real we'll know a little better when the Easter retail figures are in. Those will show, not how poor we are, but how frightened by the thunder of our own statistics.

Priming will be done, and the psychology of that is good. What can be done can't possibly pump much actual cash into turnover channels for a long time. But it can make people brave. And that's really all we need so we can get back to worrying about inflation again!

Yours faithfully,

Vernon Mount

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MAGNESIUM LIMESTONE

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Phosphorus and Compounds of Phosphorus

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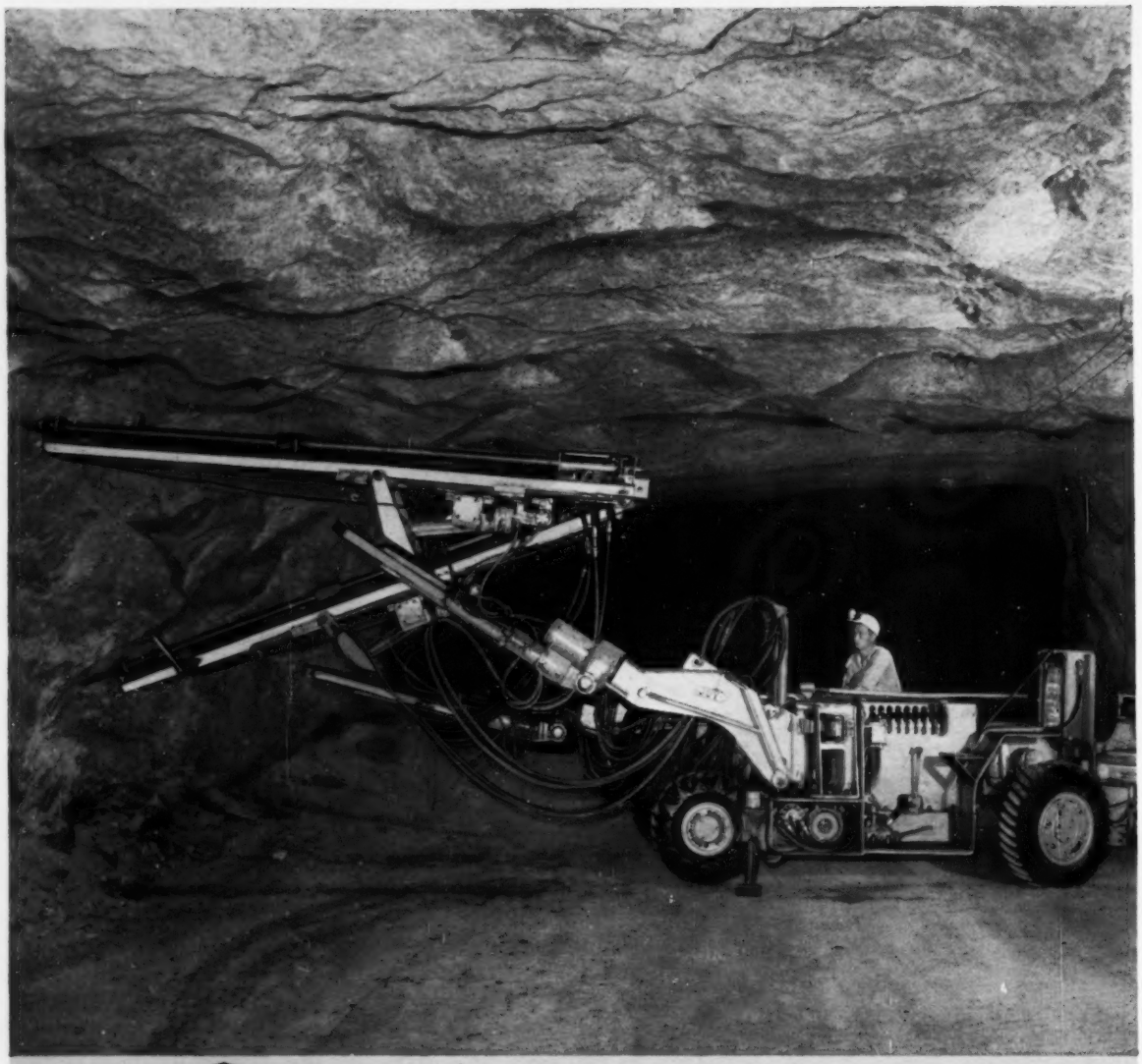

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Drilling blast holes with a multiple mounted drill in the Duval mines near Carlsbad, New Mexico. One of the many processes which bring you . . .

High Grade Muriate of Potash...

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3. The ability of TREBO-PHOS to ammoniate at high rates means manufacturers may choose from a wide range of nitrogen carriers.

4. Early indications are that the physical condition of TREBO-PHOS makes possible *complete* and *uniform* absorption of ammonia. A well conditioned mixed fertilizer which is dry and drillable should be the result.

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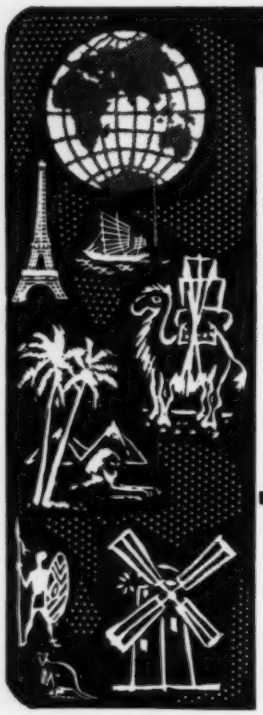

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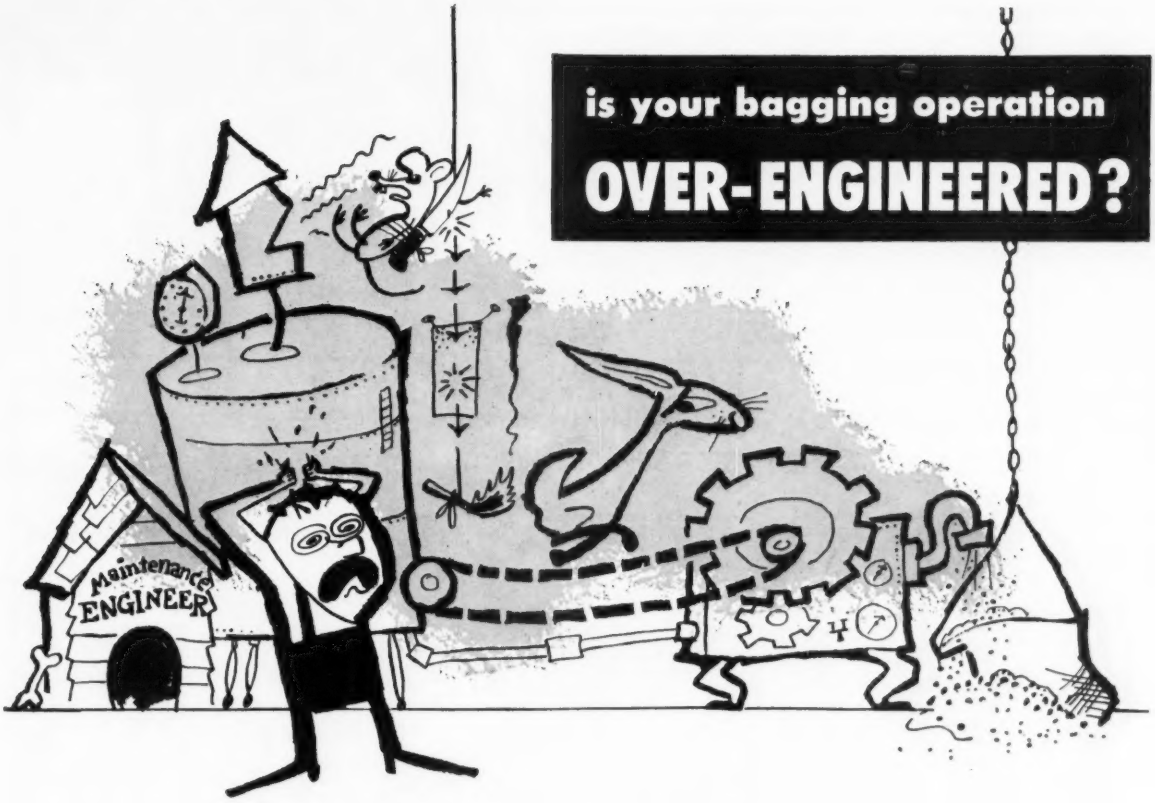
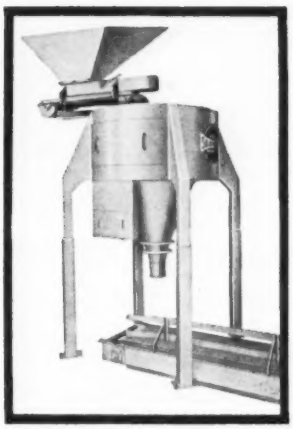
Phones: RA 3-4838 & RA 3-4829



You need the new SOUTHLAND PACKER!

- **IT'S SIMPLE!** Just one scale system—*not two or three*—fewer moving parts, wearing points.
- **IT'S FAST!** Up to 30 50-lb. bags per minute, up to 25 80's and 100's—more than a single sewing machine can handle.
- **IT'S GUARANTEED ACCURATE!** Maintained weighing accuracy is guaranteed on 50-lb., 80-lb., 100-lb., and 200-lb. bags.
- **IT'S DURABLE, RUGGED!** Heavier, more rigid construction—generous use of stainless steel and non-corroding nylon bushings.
- **IT'S COMPLETELY ELECTRIC!** No troublesome air cylinders or hydraulic connections—needs no compressor.

The SOUTHLAND costs less, *saves more* . . . less spillage and dusting; minimum headroom and floor space; simple installation and maintenance. Enthusiastic users say it's "tops" in dependability.



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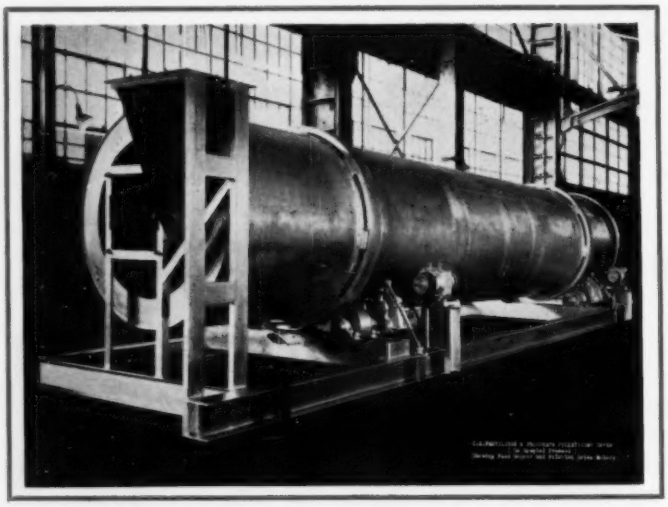
STURDY HEAVY CONSTRUCTION FOR LONG LIFE
SELF CONTAINED - SELF SUPPORTING

YET COMPETITIVELY PRICED



FEED END OF SPECIAL PELLETIZING DRYER

MANUFACTURERS OF:

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- SMALL BULK PLANTS
- SHIPPING MILLS
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- MACHINERY TOWERS
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ALL OF OUR EQUIPMENT IS DESIGNED AND CONSTRUCTED BY ENGINEERS WHO HAVE A THOROUGH KNOWLEDGE OF ALL PHASES OF THE FERTILIZER BUSINESS, INCLUDING FORMULATING, MATERIAL SCHEDULING, MANAGEMENT, DESIGN AND INSTALLATION OF EQUIPMENT AND BUILDINGS. WE KNOW OUR EQUIPMENT AND WHAT IT CAN DO FOR YOU SO **WE BACK IT UP WITH A GUARANTEE.**

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CHEMICAL ENGINEERING SERVICE,
(FORMERLY GREEN BAY, WIS.)

DIV. OF

MANITOWOC SHIPBUILDING INC.
MANITOWOC, WISCONSIN, U.S.A.

Arcadian® News

Volume 3 | For Manufacturers of Mixed Fertilizers | Number 4

Nitrogen Division Broadcasts to Millions of Farmers....

Buy Your Mixed Fertilizer Now!

Everybody is talking about the late season. Nitrogen Division, Allied Chemical, is doing something about it!

On regular broadcasts on 60 radio stations in leading fertilizer-consuming areas, Nitrogen Division began in early March to tell millions of farmers: *"Don't wait . . . you may be late . . . buy your mixed fertilizer now!"*

Throughout the winter and spring, many Nitrogen Division farm magazine advertisements have stressed the importance of using plenty of mixed fertilizers. Hundreds of Nitrogen Division billboards have carried the message: *"The Best Fertilizers are Mixed Fertilizers—BUY YOURS NOW!"*

The big radio campaign is now adding extra impact and momentum to the Nitrogen Division effort to speed-up the movement of mixed fertilizers. We trust that you are pleased with the results of this campaign designed to help you mix and ship more tonnage.

The Best Fertilizers
are Mixed Fertilizers
Buy Yours NOW!
NITROGEN DIVISION, ALLIED CHEMICAL · SUPPLIERS OF NITROGEN TO THE FERTILIZER INDUSTRY

Here is a Nitrogen Division billboard in hundreds of locations in leading farming areas.

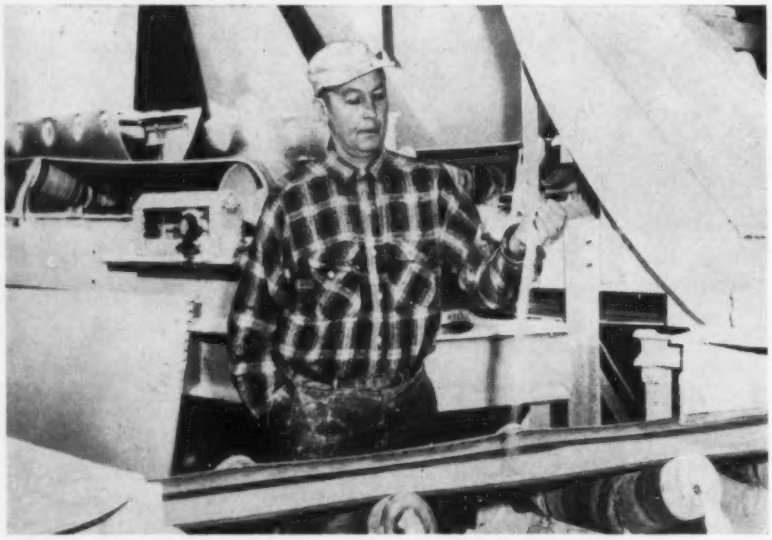
NITROGEN DIVISION BUY FERTILIZER NOW RADIO BROADCASTS

Here are three typical Nitrogen Division radio broadcasts now going out over 60 radio stations to urge farmers to buy mixed fertilizer now:

It's a good idea every year to buy mixed fertilizer early so that you get what you want and have it on hand when you need it. This year it's far more important than usual to place your order now! Many farmers have delayed buying mixed fertilizer because of weather conditions. It won't be long before thousands of farmers will all be wanting mixed fertilizer at the same time. Some farmers will be disappointed. They will be waiting in line for mixed fertilizer when they need it. Fertilizer manufacturers will find it difficult to supply a big rush of late orders. Don't wait . . . you may be late! See your fertilizer dealer today! Buy your mixed fertilizer now and take it now!

If you are a farmer, there's no need to tell you that this is a late season. It's a late season all over the country due to a cold winter and a late spring. It's a late season for you and a late season for the manufacturer who makes the mixed fertilizer you plan to use. That's why it will pay you to buy your mixed fertilizer now. Buy it now and take it now! That's mighty good advice. Farmers who wait too long may find it's too late to get the mixed fertilizer they want. Fertilizer manufacturers are going to find it difficult to supply a big rush of late orders. Don't wait . . . you may be late. See your dealer today and place your order for mixed fertilizers.

When you need your mixed fertilizer this year, will you have it on your farm, or will you be waiting in line to get it? The answer to this question depends on what you do right now. This is a late season due to weather conditions. Fertilizer manufacturers will have to work day and night to supply a lot of late orders for mixed fertilizer. Some farmers will be disappointed. They will be waiting in line for mixed fertilizer when they need it. Don't wait . . . you may be late. See your dealer today. Buy your mixed fertilizer now and take it now. That's the best way to make sure you get the amounts and grades of mixed fertilizers you want.



Methods that Speed Mixing and Curing

We have had late fertilizer seasons before, but this is one of the latest in history. Due to unusual weather conditions, farmers have delayed buying fertilizer. Last-minute buying by farmers will require peak production of fertilizers during a very short period.

Manufacturers who are able to produce mixed fertilizers at a rapid rate will make more sales. Getting the tonnage out is a daily challenge that requires all the ingenuity and enterprise the manufacturer can muster. Mixing, curing, bagging, and loading on trucks will have to be done much faster than in normal seasons.

Here is one of the many Nitrogen Division full-page farm magazine advertisements, promoting the use of mixed fertilizers.

During previous rush periods, manufacturers developed ways to speed output. This know-how is valuable today. A brief review of some of the methods now being used in the industry may be helpful to you.

Advance Planning

It pays to have an adequate inventory of raw materials. The best way to meet production schedules is to estimate requirements and place orders in advance so that supplies are on hand when needed. A steady flow of raw materials is vital to continuous production.

It's also important to have an inventory of popular analyses of mixed fertilizers on hand. Mixing and storing grades you know will be in demand helps to fill more orders to satisfy more customers.

Plan to use late-season, extra bin space for dumping in small piles for faster curing. Plan to keep bagged fertilizers stacked low to reduce bag set.

Prompt truck loading moves out more tonnage. Organize traffic patterns for

incoming and outgoing trucks to speed handling.

During rush work, extra safeguards are essential to the protection of equipment and personnel. A regular routine for checking equipment avoids breakdowns. Most accidents are caused by green help. New men need training and supervision. Taking time to teach them their jobs increases efficiency and safety.

Maximum Ammoniation

Ammoniated mixtures made with large amounts of solid nitrogen materials cure slowly. Decreasing the amounts of solid materials and increasing the use of ARCADIAN® Nitrogen Solutions produces mixtures that cure more rapidly.

Direct from tank car or storage, these Solutions can supply in one operation different forms of nitrogen often added as separate materials. This saves time, labor, traffic, and expense.

Using ARCADIAN Nitrogen Solutions at maximum rates of ammoniation produces mixtures that cure quickly. The maximum ammoniation rate pays off in extra volume of better quality fertilizers that can be bagged promptly for fast delivery. Some manufacturers successfully mix and ship the same day.

Reduce Water Content

Selection and use of ARCADIAN Nitrogen Solutions with a low water content helps to speed up drying and curing of ammoniated mixtures. This is especially true when the superphosphate has a relatively high water content.

Your Nitrogen Division technical service man can help you select NITRANA® and/or URANA® Nitrogen Solutions with low water content that will help you speed your production of good quality mixed fertilizers.

Crystal Structure

The improved crystal structure produced by ammoniating with URANA Nitrogen Solutions is a big help to manufacturers during this rush season. The cube-shaped crystals have much less tendency to bind together.

This means softer set in storage piles, easier, faster handling from bulk to bagging, and far less secondary caking in the bag. URANA Nitrogen Solutions also supply three forms of nitrogen – ammonia, ammonium nitrate, and urea.

Some manufacturers switch from granular fertilizers to pulverized fertilizers during the rush season to increase production. By using URANA Nitrogen Solution for faster cooling and curing, they are able to double their output.

NITROGEN DELIVERIES DEPEND ON TANK CARS

Don't hold tank cars — keep 'em rolling to speed Solutions shipments on schedule

Nitrogen Division, Allied Chemical, has geared all of its facilities and operations to rapid delivery of Nitrogen Solutions to help you meet production schedules during the rush period. The goal is *on-time* shipment every day.

As America's leading producer of the most complete line of Nitrogen Solutions, Nitrogen Division is equipped to provide the best available service. The Nitrogen Division plants at Hopewell, Virginia, Ironton, Ohio, and Omaha, Nebraska, are conveniently located for fast shipment to many areas.

Nitrogen Division has always operated the largest fleet of Nitrogen Solutions tank cars in the industry, and has recently added 200 new units especially designed for handling Nitrogen Solutions. Nitrogen Division maintains a network of intransit locations to expedite shipments.

Nitrogen Division is doing its utmost to keep all of its delivery facilities operating at top efficiency during this period of peak demand. Extra effort is being exerted to keep the tank cars rolling to your plant to supply you with Nitrogen Solutions when you want them.

The only thing that can interfere with this service is a tank-car bottleneck. Despite the fact that Nitrogen Division is operating more tank cars than ever before, if too many fertilizer manufacturers hold too many tank cars too long, a shortage may develop to slow down deliveries.

You can cooperate to help Nitrogen Division give you better service by returning empty tank cars as quickly as possible. Empty cars sitting on sidings can create a bottleneck. So unload tank cars as fast as you can and return them as fast as you can.

You cannot mix and ship tonnage on schedule if you are waiting for Nitrogen Solutions. And Nitrogen Division cannot ship Solutions on schedule if tank cars are not available. Don't hold tank cars! Keep them rolling to serve you!

Ask Nitrogen Division

Nitrogen Division technical service men have a thorough knowledge of methods used by manufacturers to speed production of good-condition mixed fertilizers. It will pay you to get their advice and assistance. This service is available to customers without charge. Simply contact Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y. Phone: HAnover 2-7300.

HERE'S THE BIG LINE OF Arcadian® NITROGEN SOLUTIONS

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	26
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
10	44.4	24.5	56.0	10.0	9.5	11.0	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.925	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	—

Other ARCADIAN® Nitrogen Products: UREA 45 • A-N-L® Nitrogen Fertilizer Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

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Memphis 9, Tenn., 1929-B South 3rd St. ..... Whitehall 8-2692
Columbia, Mo., P. O. Box 188 ..... Gibson 2-4040
Indianapolis 20, Ind., 6060 College Ave. ..... Clifford 5-5443
Kalamazoo, Mich., P. O. Box 869 ..... Kalamazoo 5-8676
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San Francisco 4, Cal., 235 Montgomery St. ..... Yukon 2-6840

Associations . . . .

Iowa Council Established

Iowa has joined the ranks of States with local level plant food educational societies. The new organization has been named Iowa Fertilizer Council, and its purpose is to coordinate all segments of the fertilizer industry in Iowa with the educational forces there. Chairman of the new Council is John Porter, Iowa Plant Food Co., Des Moines, with John Pesek of Iowa State's agronomy department as secretary.

Plans are to encourage fertilizer research, publishing the findings of such research, to promote educational programs in soil fertility and testing, according to W. H. Pierre, head of the Iowa State agronomy department, who was a prime mover in the formation of the Council. Said he, "The council will provide for discussion of problems of common interest to the college and the fertilizer industry, but will function in a strictly advisory capacity."

How to Attend Canadian Convention

As we reported last month, the annual convention of the Canadian Fertilizer Association will be held this year at the Manoir Richelieu Murray Bay, August the 20th to the 24th inclusive. Plans call for leaving Montreal on the Canada Steamship Lines vessel the S.S. St. Lawrence Tuesday, August the 19th at 6:45 p.m. arriving Murray Bay, Wednesday, August the 20th at 11:30 a.m. and then leaving Murray Bay, Sunday, August the 24th on the same vessel at 1:25 p.m. arriving Montreal, August the 25th at 7:00 a.m. All times being Eastern Standard.

Cotton Conference Dates Changed

The Beltwide Cotton Production Conference will be held at the Rice Hotel in Houston December 17-18, instead of December 18-19, as previously announced.

The production conference will be preceded by a meeting of federal-state entomologists on cotton insect control, December 14-16; a joint meeting of the Cotton Improvement Conference and Cotton Disease Council, December 15-16; and the Defoliation Conference, December 16.

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

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DEALER and FARMER

ATTITUDES AND ACTIONS

RELATED TO FERTILIZER

GEORGE M. BEAL AND JOE M. BOHLEN
Rural Sociologists, Iowa State College

(Summary of a presentation given at the Mid-West Regional Industry-Agronomist meeting, sponsored by National Plant Food Institute, February 14 at Chicago)

The findings in the first two sections of this summary are taken from Iowa Agricultural and Home Economics Experiment Station Project 1352. This project is a cooperative project between Iowa State College and the Tennessee Valley Authority. Project co-leaders, Joe M. Bohlen and George M. Beal. Data were gathered and analysis made with the aid of research team members: Larry Campbell, Quentin Jenkins and John Harp. The aid of Joe Stritzel and E. R. Duncan, Agronomy Department, Iowa State College, is gratefully acknowledged. Findings presented in the last section of this paper are taken from Iowa Agricultural and Home Economics Experiment Station Project 1236, George M. Beal project leader.

A striking fact that is of importance to the industry, to educational groups, and even to farmers is that at the present time less than 65% of the farmers are using any commercial fertilizer. According to the agronomists and economists the vast majority of those now using fertilizer are not using it in optimum amounts.

The importance of the fertilizer dealer in fertilizer distribution is evident. The fertilizer dealer's importance in the farmer decision making process has been shown in previous research studies as well as in your own nation-wide study where it was found in the North Central region over one-third of the farmers discuss fertilizer with their dealers or salesmen while in the decision making process. However, little is known about these dealers —their attitudes toward fertilizer, fertilizer use and sales, their knowledge of fertilizer, their perception of their role with the farmer and their perception of the industry. The major portion of our presentation will be a preminiary report on a small sample of dealers—their knowledge, attitudes and the perception of their role in fertilizer distribution and sales.

Befcre moving to the actual presentation, a brief word about the methodology employed in the two sections of the paper dealing with farmer attitudes.

In the past there have been some questions raised about how accurately farmer attitudes and perceptions can be obtained by the direct question schedule or questionnaire. The research workers too have recognized some of the possible limitations of this methodological approach. For example, the question has been raised as to whether the farmer is honestly stating what he believes to be true or is giving socially accepted answers—will a farmer **really** tell you what he does or believes?

Clinical phychologists have long used **projective** techniques to probe more deeply into the attitudinal and emotional structure of people. These techniques are projective in that they endeavor to induce the respondent to project himself into a relatively ambiguous situation which he then interprets and structures on the basis of his own past experiences. The basic assumption behind these methods is that in projecting himself into and expressing himself about the situations he reveals his own basic values, attitudes, emotions and motivations.

Two types of projective techniques were used in the studies presented in this paper; sentence completion and stimulus pictures. In the sentence completion method the person being interviewed is presented with beginnings of sentences which he is requested to complete. The type of questions utilized will be evident from the data presented in the first section of our paper, "Selected Farmer Attitudes Related to Fertilizer." The stimulus picture is a line drawing which is suggestive of a situation, but one in which specific details such as facial expressions or probable actions of the characters in the picture are not evident. The respondent is encouraged to describe what is going on in the picture, who the characters in the picture are, how they feel toward each other and how they might act toward each other. In some cases, as was the case in the present study, a consistent set of "probe" questions are asked of the respondent about the stimulus picture. The actual stimulus picture used will be shown and the probe questions used will be evident in the last section of this paper, "Farmer Perception of Agricultural Science and the Scientist."

Pictures From Midwest Meet **by NPFI Staff**

←

1. O. J. Arlien, Minn. Farm Bureau; W. H. Finch, Balfour-Guthrie, and Glen Bunting, Central Farmers Fert.
2. A. J. Ohlrogge, Purdue University; Z. H. Beers, NPFI, and W. P. Martin, U. of Minnesota.
3. Paul Truitt, NPFI, and A. T. Beauregard, Monsanto Chemical Co.
4. Harold Rhoades, Clinton Hoover, U. of Nebraska, and Charles Simkins, U. of Minnesota.
5. E. R. Duncan, Iowa State College, Richard Koos, and Charles Durham, Ashkum Fert. Co.
6. Ben Gibson, Bradley & Baker; E. T. Potterton, Int. Min. & Chem., and John Abbott, Ashkum Fert. Co.
7. Herb Garrard, Amer. Potash Inst.; Lee Hayes, The Texas Co., and Yontz Bonnett, Hoblit-Bonnet Fert. Co.
8. Bob Borg, National Potash; W. T. Corl, Darling & Co., and Joe F. Stough, U. S. Potash Co.
9. Charles Hendrix, TVA, and E. C. Doll, U. of Kentucky.
10. R. G. Fitzgerald and J. C. Evans, Smith-Douglass Co., Inc., E. B. Norum, North Dakota Agric. College.
11. A. L. Judkins, U. S. Steel; M. K. Miller, Green Belt Fert., and D. E. Trier, U. S. Steel.
12. Don Cook, Farm Bur. Coop. of Ohio; Chet Johnson, Land O' Lakes, and Z. H. Beers, Reg. Dir. NPFI.
13. G. P. Walker, Purdue U.; W. S. Colvin, Nitrogen Div., and H. S. Douthit, Int. Min. & Chem.
14. Bernie Manker, Davison Chem. Co.; N. T. White, Smith Agric. Chem. and H. J. Coleman, Sohio Chem. Co.
15. R. V. Olson, Kansas State College; Armand Baur, North Dakota Agric. College, and Frank E. Robinson, Purdue University.
16. Frank Nelson, Rath Packing Co.; Cash Cahill, National Potash Co., and W. A. Harris, St. Regis Paper Co.
17. George Enfield, U. S. Dept. of Agric., and J. F. Davis, Michigan State College.
18. T. L. Wainscott, Successful Farming and C. E. Trunkey, U. S. Industrial Chem.
19. W. M. Newman, Price Chem.; J. D. Stewart, Jr., Federal Chem.
20. W. J. Klossner, Swift & Co.; John Zigler, Int. Min. & Chem., and Kirk Wagenseller, Swift & Co.
21. A. H. Bowers, Swift & Co.
22. A. M. Horeheld, Sinclair Chem. and Laurie Peterson, Midland Coop.
23. C. F. Stegall, Amer. Cyanamid, and H. F. Boyd, Farm Bureau Coop.
24. E. B. Norum, North Dakota Agric. College and L. F. Puhr, So. Dakota State College.
25. J. A. Howell, Commercial Solvents; Ralph Douglass, Smith-Douglass and J. R. Taylor, Jr., Grand River Chemical, Deere & Co.
26. Dr. Orlo Musgrave, and George Gist, Ohio State University.
27. Geo. Kingsbury, Kingsbury & Co., and John Zigler, Int. Min. & Chem. Corp.

Selected Farmer Attitudes Related to Fertilizer

Another presentation at this meeting, "Our Farmers Attitudes Toward Fertilizer" dealt at length with farmer opinions, attitudes, knowledge and actions in relation to fertilizer. We would like to present some additional findings. These findings probe into additional attitudinal areas and were obtained by use of the sentence completion method. The data were gathered by interviews with a random sample of 120 farmers drawn around a purposive sample of 12 dealers distributed over the South Eastern third of Iowa.

The actual sentence completion statement used in the interview and our categorization of the answers obtained are presented. It should be kept in mind that these sentence completions were given by farmers.

1. "The thing I **like** most about my fertilizer dealer is . . ."[1]

He gives me good service	26%
He is friendly and helpful	25%
He is honest and reliable	23%
He has low prices	3%
He doesn't bother me	3%
Have no feelings toward him and/or I don't have a dealer	20%

[1]*The questions were not asked in this order on the schedule. They are presented in this sequence in the report to facilitate comparison of similar items.*

2. "The thing I **dislike** most about my fertilizer dealer is . . ."

The poor service he gives: won't help spread, doesn't soil sample, poor spreader, etc.	8%
His personal characteristics: nervous type, he smokes cigars, wish he'd join our church, etc.	4%
He oversells me on fertilizer	3%
He doesn't keep close contact with us farmers	2%
I have no dislikes toward my dealer	70%
Those who stated they have no dealer	13%

3. "I buy my fertilizer where I do because . . ."

He is a likeable dependable dealer	25%
It is convenient	23%
Of the lower prices and/or refunds: mainly patronage refunds, co-op and Farm Bureau Service companies	17%
Of the good services offered	9%
Regular place of business	6%
Of personal reasons: work there, he is a relative, needs business, etc.	5%
Don't use fertilizer and no answer	15%

4. "The thing I like most about fertilizer is . . ."

It boosts my yield	52%
It builds my soil	7%
It boosts my yield and builds my soil	3%
The return I get on my investment	14%
Other	4%
But, I don't like it	8%
Don't use fertilizer or no answer	12%

5. "The thing I dislike most about fertilizer is . . ."

Handling and/or applying it	57%
The cost—the economics of it	20%
It harms my crops and/or soil	7%
Other	3%
There is nothing I dislike about it	5%
I don't use fertilizer	3%
Don't know and no answer	5%

1. W. C. Duncan, Purdue University, and G. R. Gist, Ohio State University.
2. John Falloon, U. of Missouri, and A. C. Caldwell, U. of Minnesota.
3. John Sargent, Federal Chem., and Bernie Manker, Davison Chem. Co.
4. Cecil H. Fluty, Farm Belt Fert. Co., and W. P. Glaspey, Blue Valley Fert. Co.
5. Sid Rogers and W. B. Porterfield, National Potash Co.
6. G. W. Kraemer, Int. Min. & Chem., and George Mitchell, National Fert. Co.
7. S. H. Aldrich, U. of Ill., and Forrest Quackenbush, Purdue U.
8. L. E. Quiram, Central Farmers Fert., and Frank Calvin, Farmers Union Cent. Exch.
9. W. F. Farley, Smith Agric. Chem. Co.
10. Harry L. Cook, Farm Bureau Coop. and Dr. Geo. Scarseth, Amer. Farm Research Assn.
11. Emil Truog, U. of Wisconsin.
12. W. H. Pierre, Iowa State College.
13. J. L. Schell, Kingsbury & Co., and Dale Friday, Nitrogen Div.
14. G. L. McGuffey, Sohio Chem.; A. P. Gates and C. H. Godfrey, Va.-Carolina Chem. Co.

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One-stop source for major fertilizer nutrients

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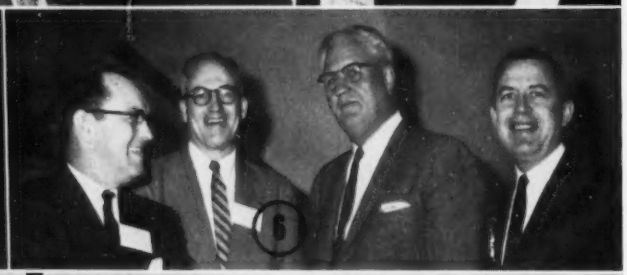
More Midwest Pictures

by

NPFI Staff



6. "I'd use more fertilizer but . . ."

It costs too much	31%
I don't need any more	27%
I'm not convinced it does any good	14%
My landlord doesn't approve using more	11%
The weather limits the results I get	4%
Other	5%
I'm going to start using it	3%
Don't now use any fertilizer	5%

7. "When I use fertilizer the thing I worry most about is . . ."

The weather	30%
Will it really pay me	25%
Getting the right analysis and right amount on	13%
Proper spreading	9%
Storing and handling it	7%
Getting it when I want it	1%
I don't worry	7%
Don't use fertilizer	8%

8. "When I first hear about a new kind of fertilizer I . . ."

Try some of it	12%
Want to learn more about it	45%
Am undecided or don't know what to do	3%
Am skeptical or don't pay much attention	12%
Am not interested	19%
Don't hear about it and/or no answer	9%

9. "When my fertilizer dealer tells me about a new fertilizer I . . ."

Try some of it	9%
Discuss it with my dealer	9%
Want additional information: ask others about it, ask landlords, etc.	32%
Listen and/or think about it	23%
Don't pay much attention: laughs at him, question using it, don't listen, etc.	14%
Never have been told my dealer	13%

10. "When Iowa State College or the Extension Service recommends that a farmer use a certain amount of fertilizer per acre I . . ."

Go along with it	43%
Will probably go along with it	20%
Listen and/or think about it	13%
Want more information about it	6%
Am not interested	3%

1. R. L. Cook, Mich. State College, and James A. Naftel, U. S. Borax & Chem.
2. L. C. Lamson, Amer. Cyanamid; Phil Stocker, Land O' Lakes, and J. M. Coates, Int. Min. & Chem.
3. J. J. Lanter, Central Farmers Fert.; C. H. Fluty, Farm Belt Fert.; Merle Blue, Consumers Co-op.; Art Fahrenkrog, Ill. Farm Supply and R. R. Zurbuchen, Consumers Co-op. Assn.
4. Werner Nelson, Amer. Potash Inst.; W. E. Irwin, Phillips Petro. and L. L. Schrader, Standard Oil Co.
5. W. S. Colvin and M. E. Hunter, Nitrogen Div. Raoul Allstetter, NPFI, and R. Parks, Grace Chem. Co.
6. Z. H. Beers, Reg. Dir., NPFI; Garth Volk, Ohio State; Dan Williams, Minn. Farm Bur.; and M. B. Russell, U. of Ill.
7. Ed Carbon, N. S. Koos & Son; E. T. Potterton, Int. Min. & Chem. and Grace Koos Anderson, N. S. Koos & Son.
8. R. E. Bennett, Farm Fert.; Stanley Smith, Darling & Co., and N. T. White, Smith Agric. Chem. Co.

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PACKAGING SPECIALIST
"WHITEY" CAMPBELL

shows packer how to pocket $85,000

$85,000! That's the *annual* dollar savings one user of Multiwall bags will enjoy as a result of a recent Union packaging survey.

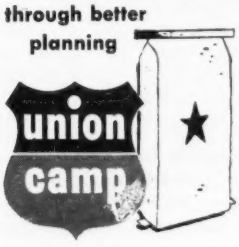
The survey, made by Union Packaging Specialist "Whitey" Campbell, showed that: (1) $57,000 a year could be saved simply by switching the company's 3-ply domestic baler bags to 2-ply's. (2) reinforced sewing construction on 100-lb. packages would save 20# basis weight per bag . . . and additional thousands of dollars in costs depending on the number of bags used.

Union Multiwall Recommendations are based on this 5-Star Packaging Efficiency Plan

- **DESIGN**
- **EQUIPMENT**
- **CONSTRUCTION**
- **SPECIFICATION CONTROL**
- **PLANT SURVEY**

These were the major recommendations made and put into effect through Union's 5-Star Packaging Efficiency Plan. Total savings are expected to amount to more than $85,000 when all improvements are completed. How much could this plan save you?

Better Multiwall performance through better planning



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Don't believe them	10%
Other	3%
Don't know what I'd do	2%

11. "The farmer who has his soil tested every two years is . . ."

A good farmer: doing what's right, a wise farmer, smart, etc.	87%
Over doing it: don't need it that often, etc.	7%
Not up to date: should do it every year	2%
Other	4%

The Role of the Fertilizer Dealer

INTRODUCTION

In the introduction to this report the importance of the fertilizer dealer in farmers' adoption of fertilizer and fertilizer sales was pointed out.

To date little has been validated empirically concerning the dealer's knowledge, attitudes and perceptions of fertilizer and fertilizer use and how these traits are related to the role he plays in fertilizer adoption and sales.

The data reported below are taken from a preliminary pilot study. This study was designed to develop research techniques to be used in studying a state-wide study* is now in process and some of the findings will be available within the year.

**Supported in part by the Tennessee Valley Authority*

The sample from which the data herein reported were gathered is too small to warrant generalization to any state-wide population.

Despite the limitations on generalization, the findings of this study were considered important enough by the parties concerned to be presented at this meeting, if for no other purpose than to point out the direction in which the research is going and to provide some clues as to the substantive findings which might be anticipated.

These data were gathered from a purposive sample of twelve dealers who operate their businesses in the southeastern one-third of Iowa, in the trade areas of the farmers whose responses were reported in the first section of this paper.

1. Characteristics of the Business:

Fifty per cent of these businesses were sole proprietorships, thirty-three per cent were co-operatives, eight per cent were partnerships and eight per cent were corporations. They employed from two to twelve employees with an average of six employees per business. They had a gross volume of business which ranged from $160,000 to $800,000 a year with an average gross volume of $312,000.

The range in dollar volume of fertilizer departments of these dealers was from $5,000 to $38,000 a year with an average of $18,500 gross sales in fertilizer. This amounted to a range of from 2% to 15% with an average of 6.6% of their gross volume being in fertilizer.

The managers in this study spent an average of 5.6% of their work time in management of fertilizer and .6% of their time in working in the fertilizer department. Their employees spent an average of .5% of their time in administration of the fertilizer department and 1.3% of their labor time in the fertilizer department. These dealers spent much more time in other areas of business activity. Average grain handling, storage and sales, made up 30% of their business, feed sales 43% of their business, eggs and chickens 5% and lumber and building materials 4%. They also handled many other types of merchandise.

2. Dealer's Perception of Fertilizer in Business:

The dealers in this study had varied opinions of the role of fertilizer in their business. When asked the question, "Please indicate your evaluation of the importance

of fertilizer to your total business from this list of statements," the items were checked in the following manner:

A good money maker in itself 33%
An important service to bring in business 50%
Another customer service 75%
Not a money maker, but have to carry fertilizer to compete with other business 33%

3. Dealer's Perceptions of Dealer's Role in Fertilizer Use:

When asked if they thought that they should try to influence farmers' decisions about how much to apply, 92% of the dealers responded that dealers should do this. Eighty-four per cent thought that dealers should try to influence farmers as the analysis of fertilizer they buy and 100% of them thought that the dealer should influence the farmer as to the method of application.

4. Services Offered by These Business:

Services Offered by Dealers and Dealer Estimates of the percentage of customers taking advantage of them.

	Percentage of Dealers Offering Services	Estimated Percentage of Customers Using Them
1. Soil testing lab.	8%	20 %
2. Soil sampling	80%	33.2%
3. Soil test interpretation	72%	42 %
4. Credit	100%	48.8%
5. Bulk applicator	88%	30 %
6. Anhydrous applicator	50%	6 %
7. Small dry fertilizer spreaders	73%	22 %
8. Clinics	8%	40 %
9. Fall fertilizer demonstrations plots for farmer examination	8%	40 %
10. Helping farmers plan fertilizer program	90%	36 %
11. Providing newspaper information, free sheets and radio advertising	58%	51 %
12. Calling on farmers	80%	45 %
13. Throw aways and mailings	50%	95 %
14. Fair displays and booths	42%	50 %

Fifty per cent of the dealers are working with vocational ag. departments and extension service on joint educational programs. Dealers in this study were offering an average of 9.3% services per dealer. On the average, the dealers in this study felt that soil testing and interpretation, soil sampling and working with vocational ag. teachers paid off more per dollar invested in services than other techniques.

In terms of the services which the dealers as a group thought that they **should** offer, data of this study indicates that the average number of services dealers thought they should offer is less than what they are now offering. The average number that they thought they should offer being 8.8 services. Of the 15 services mentioned on the previous page, the only service which the dealers as a group thought that they should offer to a greater extent was fertilizer clinics. In all of the other cases they, as a group, were either offering all of the services they thought that they should, or they were offering services that they thought that they should not be offering.

In summary five of the dealers in the study said that they should not provide more customer services and seven said that they thought they should. As was pointed out earlier, most of these thought that they should add more fertilizer clinics to their service program.

Over forty-two per cent of the dealers in this study said that they would offer more fertilizer services if they could receive some help from outside sources such as the wholesaler or jobber of fertilizer. Those services most frequently mentioned as being added if they could re-

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Shown at the recent Executive Committee meeting held in connection with the Midwest Regional meeting of the National Plant Food Institute are, back row, (left to right): Dr. Russell Coleman, Executive Vice President of the Institute; H. A. Parker, Sylacauga Fertilizer Company; L. Dudley George, Richmond Guano Company; Dean R. Gidney, United States Potash Company Division, United States Borax & Chemical Corp.; E. J. Bock, representing John L. Christian, Monsanto Chemical Company, Inorganic Chemicals Division; Paul T. Truitt, Executive Vice President of the Institute; seated (left to right): Ralph B. Douglass, Smith-Douglass Company, Inc.; C. T. Prindeville, Swift & Company, Chairman of the Board of Directors and Executive Committee; and John A. Miller, Price Chemical Company, President of the Institute.

Members of the MWSIC Board of Directors and NPFI Regional Advisory Committee, seated, left to right: L. E. Quiram, R. G. Fitzgerald, R. E. Bennett, chairman, J. D. Stewart. Standing, left to right: C. R. Martin, R. A. Garn, W. W. Venable, A. C. Norris, Z. H. Beers, E. T. Potterton, M. A. Blue and Frank Nelson.

ceive outside help were soil testing and sampling and bulk or liquid application. Also mentioned were country sales calls, extension of credit to the end of the crop year, newspaper advertising and expansion of the fertilizer department.

5. Best Selling Techniques:

When asked what was their best technique for selling fertilizer a wide variety of answers were received. Soil sampling and testing was mentioned by 24% of the respondents, 16% of the respondents mentioned general services and 16% mentioned on-the-farm selling as their best technique. Other techniques mentioned as being most effective in selling fertilizer included helping farmers plan fertilizer program, credit, bulk spreading, free delivery, and hard selling methods.

6. Roughest Competition:

When asked what techniques other salesmen or dealers were using against them that made fertilizer sales most difficult, 82% of the group mentioned low prices. Other things mentioned were quantity and delivery discounts, deferred payment plans, free soil sampling and bulk spreading.

7. Personal Characteristics:

The dealers in this study ranged in age from 23 to 63 with an average age for all the dealers in the study of 41.4 years.

Thirty-three per cent of the dealers in this study had gone to high school. Sixty-six per cent of the dealers in the study had had some college experience and 50 per cent of the sample had college degrees. Sixty-six per cent of the dealers in this study had attended a fertilizer short course at some time or another in the past three years.

8. Attitudes and Knowledge:

To get at the attitudes and knowledge of the dealers in this study several scores were devised. One of these scores dealt with **knowledge** of soil testing and soil sampling and fertilizer use. The total possible score in this soil testing knowledge scale was 60 points. The scores ranged from 0 to 48 with a mean score of 32.2. There was also a scale devised to measure **attitudes** toward soil testing and fertilizer use. The total possible score on this scale was 55 points. The range of these scores was from 28 to 55 with a mean score of 46.5. In other words, the dealers in this study in general were favorable towards soil testing as a technique in using fertilizer.

Another scale used in this study was one on **progressivism.** This was a scale devised to measure the dealers' attitudes toward acceptance of new practices and techniques in merchandising in their businesses. A total possible score on this scale was 50 points. The range in scores was from 30 to 47 with a mean score of 38.

Another scale was devised to measure the dealers' attitudes toward **scientific farming** and the acceptance of innovations and practices on the part of the farmer. A total possible score on this scale was 55 points. The scores made by the dealers ranged from 30 to 53 with a mean score for all of the dealers of 42.8.

9. Dealer's Conceptions of Farmers' Fertilizer Usage:

The dealers in this study were asked what they considered to be the major factors limiting farmers' use of fertilizer. When asked this question without a checklist and responding on the basis of the ideas that came to their minds, the most frequently mentioned limitation was the lack of available capital, mentioned by 72%. Lack of knowledge of fertilizer was the next most frequent response, mentioned by 65%. Also mentioned were dry weather, the amount of labor involved in spreading it and unwillingness on the part of the farmers to change their practices. When the dealers were given a checklist on which they could respond regarding this question, those items checked most frequently as limitations were, in the order of mention, lack of knowledge about fertilizer, lack of available capital, dry weather and type of farming lease.

The dealers were also asked how important they thought the using of commercial fertilizer was to the income and the prestige of the farmer. Insofar as the importance to the farmers' income is concerned, 8% thought fertilizer usage was an absolute necessity, 50% thought it was very important, 33% thought the use of fertilizer was important, and 8% of the dealers said that fertilizer use was not important to the farmers' incomes. When

asked how important they considered fertilizer to the prestige of the farmer in his community; none thought it was an absolute necessity, 42% thought it was very important to the farmers' prestige, 42% thought it was important to the farmers' prestige and 16% thought that it was unimportant to the farmers' prestige.

Another area of interest in terms of the dealers' perceptions of the farmer and his fertilizer use were the observations of the dealers as to the percentage of the farmers using fertilizer in their trade area. This is doubly important because in several of the cases the dealers trade areas overlapped so there couldn't be the inconsistency in actuality that there was in the minds of the dealers. We found a range of opinion regarding the percentage of farmers using fertilizer from 20% of them using it to 90% of them using it. This range was set by two dealers with overlapping trade areas! The average percentage of farmers using fertilizer according to the dealers' perception was 54%. This figure is consistent with the actual findings of other studies.

10. Sources of Information Used by Dealers and Their Attitudes Toward Them.

When asked what sources of information they considered to be most important to their fertilizer business, the dealers ranked government agencies first, commercial sources were a relatively close second. Mass media and farmers were poor third and fourth.

When asked which sources they considered to be most reliable, government agencies ranked first with commercial sources a very close second and again mass media and farmers a poor third and fourth.

11. Farmer Perception of Agricultural Science and the Scientist:

The commercial company prides itself in doing scientific research of value to the farmer. The concepts of science, scientific research, the scientist and scientific farming are often used in commercial advertising. There is apparently the assumption that the use of "science" in advertising will help get the attention of the farmer, establish the credibility of the message and help secure the intented action in relation to the message. A basic question may be raised as to just what "science" means to farmers.

Recent studies in Iowa and Ohio[1] using projective stimulus pictures attempted to get at some of these farmer attitudes, feelings and understandings about science, the scientist and scientific findings. The data reported here are taken from the two Iowa Exploratory studies. The number interviewed in these studies was small, 65 in all. Findings must be regarded as exploratory and tentative. No claim is made that these data explain all farmer attitudes and beliefs about science even of those farmers interviewed. However, it is believed that these findings do reflect the attitudes, understandings and feelings of those interviewed regarding certain facets of farmer perceptions of "science" as portrayed in the stimulus picture used.[2]

1. **What kinds of things do scientists work on that might be of importance to farmers?**

Those farmers who perceived the scientist working on a broad range of agricultural problems as well as on basic research (rather than doing functional research such as cow testing or soil testing) are the most rapid adopters and adopt more recommended practices.

2. **How does the farmer in the picture feel toward the scientist?**

In relation to this question attitudes ranged from, "Farmers welcome everything they (scientists) can do." to, "Most farmers are generally unfavorable toward scientists, I think." There was a highly significant relation between favorableness of attitude toward the scientist and the number and rate of new practices adopted.

3. **How does the scientist probably feel toward the farmer?**

Approximately 39 per cent of the farmers stated they believed the scientist had favorable attitudes toward the farmer.

Approximately 24 per cent said the scientist had a neutral attitude or said they didn't know what the scientist's attitude was.

Approximately 17 per cent thought of the scientist as a convincer—trying to get the farmer to use new ideas, "pushing" new ideas.

Over 20 per cent of the farmers thought the scientist had some kind of negative attitudes toward the farmer.

There is a distinct tendency for those farmers who saw the scientist as having favorable attitudes toward the farmer to be using proportionally more commercial products in their farming enterprise.

4. **Who does the scientist work for?**

Slightly over half of the farmers perceived the scientist as working for the government or agricultural colleges.

One-third mentioned commercial concerns.

Approximately 8 per cent mention such groups as soil test associations.

Approximately 8 per cent stated they did not know who the scientist worked for.

There seemed to be no relation between who the farmer perceived the scientist working for and the rate and number of adoption of practices.

5. **Would the farmer place more faith in what the scientist finds if the scientist worked for the government or for a commercial concern?**

Approximately 40 per cent said it would make no difference.

Approximately 50 per cent stated they would have more faith in the government scientist.

Approximately 10 per cent gave don't know answers.

Those farmers who adopted more practices and at a more rapid rate tended to put more credibility in the

Left to right: Dr. W. H. Pierre, Iowa State College, newly elected chairman, North Central Soils Research Committee; Dr. W. P. Martin, University of Minnesota, chairman of Midwestern Agronomists, and C. A. Simkins, University of Minnesota, chairman of Midwest Extension Agronomists.

[1]The Iowa data reported here are taken from two recent studies done under Iowa Agricultural and Home Economics Experiment Station Project 1236, George M. Beal, project leader. One of these studies was partially supported by a grant from the Foundation for Research in Human Behavior, Ann Arbor, Michigan. Much of the work under this grant was completed by Everett M. Rogers, a Graduate Assistant at Iowa State College. A subsequent state-wide study in Ohio conducted by Rogers, now an Assistant Professor at Ohio State University, support similar conclusions where comparable data were gathered.

[2]An enlargement of the actual stimulus picture used in the field interviews was shown at this point in the presentation.

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government scientist. A greater proportion of those farmers who stated it would make no difference tended to adopt fewer practices and at a slower rate.

6. **Is the farmer interested in what the scientist is doing?**

Approximately 60 per cent said the farmer was definitely interested.

Approximately 20 per cent said the farmer was usually or sometimes interested.

Approximately 15 per cent stated the farmer was not very interested.

The data support the hypothesis that those who use a high proportion of commercial products in their farming enterprise are those who say they are interested in what the scientist is doing.

7. **How well does the farmer know the scientist?**

Only one farmer, an innovator, thought the farmer knew the scientist intimately. All the laggards (last adopters) stated they did not know the scientist at all.

Again it should be stated that these findings are exploratory and tentative. However, if additional research, using more precise measures and larger and wider area samples, support these findings there seem to be many implications in the data for commercial concerns in commercial product education and promotion.

research briefs

Degree days, which we had thought applied mostly to our gas bill, are being used to predict the proper time to cut asparagus up in New Jersey. This time varies from March 25 to May 14, according to records from 16 years back. Now they find that the first cut appears within an average of 440 degree days (figured at 40° F.) or 29,000 gram calories per square centimeter after March 1. The New Jersey AES at Rutgers can tell you more.

♦

Avocado growers will be following with interest the experiments undertaken in San Diego County, California. The problem was, and still is, the effect of nitrogen on the micronutrients. So far they find that heavy applications of ammonium nitrate reduce the zinc, copper and boron content in the leaves . . . but they have not found evidence of micronutrient starvation. On the other hand, equivalent applications of nitrogen in the form of manure mulch steps up the micronutrients in the leaves.

Needless to say the experiments continue at the Riverside AES, under the Project Number 1630, if you want to ask more about it.

♦

Higher analyses call for modification of placement, the Maryland agronomy department says. These days when the plant food is placed directly over the seed, the tiny sprouting leaves may run directly into a heavy concentration, and quit right there. In the old days of low analysis, this made little or no difference. If the high analysis fertilizer is placed directly below the seeds, the roots may encounter the same trouble. So, they say, place your fertilizer band two inches away and one inch below the seed level.

♦

250% gain could take place in Minnesota if farmers there could adopt better fertilization and land management plans. The University studied a 27 county area and then made this statement at the Upper Midwest nitrogen conference. The figures show that instead of an average $1.50 per acre in plant food, $3.90 in added nitrogen, $3 more in phosphorus and $1.25 more in potash would bring the figures up to the 250% level, and each dollar in fertilizer would yield two dollars in net profit. It would mean $100,000,000 in extra net farm income . . . and—obviously—$50,000,000 in added fertilizer sales.

♦

Russeting of Maine potatoes is helped by sulfate of potash, the Maine AES reports. Seems a problem of Russet Burbank production in Maine has been to get tubers that are uniformly russeted . . . this detracts from appearance, but has no real effect on the yield or total solids content.

♦

Tripled crops were noted in Canadian tests, when the soil was properly limed. Tests at Fenwick, N.S. on acid Tormantine sandy loam scil showed this gain, and a further two-fold gain when fertilizer was applied in addition to the lime. The Canadian Department of Agriculture, Ottawa, is authority for these rather remarkable statistics.

♦

Poison Ivy has been defeated, according to word we have here, and so has poison oak. The conqueror is a preparation called Aqua Ivy, developed by Miss Margaret Strauss, allergy lab director at NYU's Bellevue Medical Center. It is being nationally distributed by the Allergens Division of Chemical Specialties Co. Tests are said to show it is 93% effective, without side effects. It is innoculated with a very fine hypo needle, and because it contains no alcohol, the innoculation is painless. Instead it is bottled in salt water which many laymen and all doctors know is the painless base for injections.

♦

Glycerine additives in plant food sprays speed absorption of vital minerals, according to Michigan State research. Only a small part of needed plant food can be picked up via spray on stems, bark, leaves, fruit . . . but glycerine and sugar do speed up rate and increase amount of this intake.

♦

Tomato yields in California have been increased by 10% to 15% through proper use of fertilizer, according to the California Fertilizer Association.

Research on tomato fertilization has shown that a phosphorus response can be expected on practically any soil type during the critical early spring seedling period when the soil is cold.

During 1956 and 1957 Dr. John C. Lingle of the Vegetable Crops Department, University of California, Davis, has conducted studies in cooperation with local farm advisors of San Joaquin and Yolo Counties and has found a significant phosphorus response in all soil types tested under the above conditions. Apparently the low temperature factor helps to induce a temporary phosphate fixation, even in soils with adequate amounts of PO_4.

♦

United States Rubber says a new chemical, MH-30, puts a temporary brake on plant growth by preventing division of growth cells.

In field tests, sprayed limbs stopped growing—in some cases for a full season—while the trees grew normally. Tests are continuing.

Spraying of the chemical can be done from a truck more quickly and cheaply than the present methods of cutting limbs, it was stated.

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Pavement eats up more cropland than Erosion

by JAMES BIERY
in Harvester World

FOURTEEN MAILBOXES line the road before what once was a Minnesota farm. Today it is a suburban development considered a good place to live. There are lots of trees around, the houses have big yards, and it is only five minutes by car from the edge of town.

This pleasant situation is worth noting, for it is one example of a new pattern of living that millions of Americans are adopting, a pattern that has many good features, but some potentially bad effects as well. With the aid of the automobile, city people are pressing out into the country for living room; the family car (or cars) provide easy access to work, to shopping center, to school. An illustration of how rapidly farmland can become lawn: Situated just one-half hour's drive from Milwaukee, Wisconsin, is this acreage holding 52 new homes. Two years ago it was a fertile, crop-producing land.

Most of this growth is on the suburban fringe of cities and it has many agricultural leaders worried. They see it as a new threat to farmlands that provide raw materials for food and clothing. The Soil Conservation Service recently made a study of the impact of urbanization on the nation's cropland and discovered that in 15 years more than 17,000,000 good acres had been covered with houses, factories, highways, airports and military reservations.

The Service's administrator, Don Williams, has pointed out the effects of unguided urbanization. "We don't want to deny space to our growing population. People must have new homes, better highways, more industrial plants, shopping centers and parks. The American way of life is the envy of the world. We **do** need to give some thought to **what** space we devote to these non-agricultural uses.

"We were awakened 20 years ago to the grim fact that erosion was destroying our cropland at the rate of 500,000 acres a year. Now we are engaged in a national program of soil and water conservation and are making real progress in stopping erosion.

"But an acre of productive soil covered with concrete is an acre lost for all time. It is of no more use for growing crops or food than if it were washed or blown away. **Today we are losing more land each year to urban expansion than we were losing to erosion.** New superhighways, for example, take at least 40 acres per mile. If they are located through level, fertile farmlands, rather than on the hills and shallow soils, they destroy productive cropland."

Already in use by farmers are soil surveys that classify land according to its capabilities for agriculture. Williams has suggested that these same surveys be used by city and highway planners to guide development away from the Class I, II, and III soils—the best for agriculture. He cites their use in Fairfax county, Virginia (near Washington, D.C.), where a soil scientist is employed to consult with builders, county officials and citizens on their soil problems, helping fit the suburban development of the county to the capabilities of the land.

There is, of course, room for even greater expansion of cities and suburbs, as well as farms. Only about one-fifth of the 2,000,000,000 acres in the United States is fit for cultivation, and there are already some farm products in surplus supply, though a pinch has developed in prices of vegetables, milk, and eggs —products from lands wiped out by urban expansion.

With population increasing at the rate of more than 2,000,000 people a year (220 million consumers are expected by 1975) some agriculturists are arguing that what is needed is more, not less, cultivated land. They urge that urban development be **away** from the best croplands.

BUT EROSION'S STILL AT IT!

We are losing each year by erosion many times more units of plant food than are bought in the form of commercial fertilizers.

HELP YOURSELF TO BIGGER PROFITS

PHOSPHATE PRODUCTION
No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple super-phosphates of premium quality at *way lower* cost.

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Your investment in the latest Sackett Methods of producing conventional fertilizers is *guaranteed* to pay handsome returns. We are anxious to prove it.

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Sackett Equipment leads the field in Granular Production.
The names of the fertilizer companies who have selected Sackett Granulating Processes above all others, read like a "Who's Who in Industry".

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Invest your dollars wisely by having Sackett build your new plant. We do the whole job . . . from the inception stage thru building construction and equipment fabrication to operating plant. See us for guaranteed results.

There is nothing that appeals to a man's reason more than plain facts. And, one plain fact is this . . . you can help yourself to bigger profits by resolving ***now*** to replace wasteful obsolete plant equipment with the latest rock-bottom cost methods as exemplified in Sackett Production Processes and Materials Handling Equipment. Why not start the ball rolling by writing or phoning us today?

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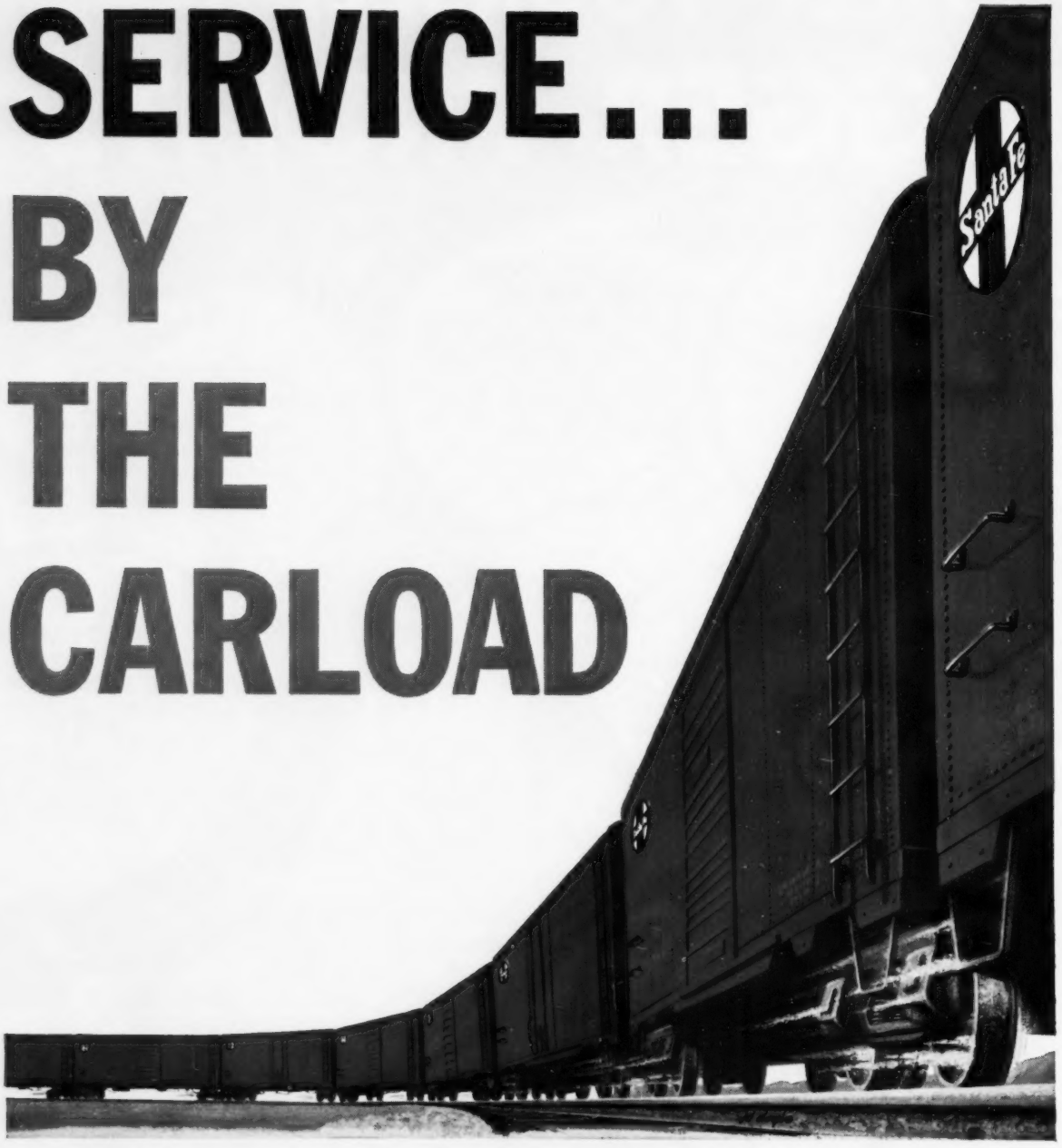

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PEOPLE

IN THE INDUSTRY

Hancock

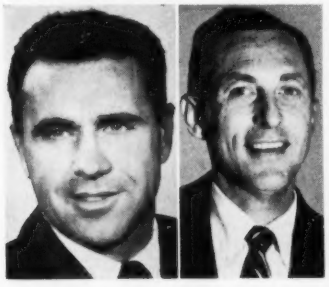
"Buster" Hancock, public relations director of Superior Fertilizer and Chemical, Tampa, Fla., has told friends he will run for Florida Commissioner of Agriculture, post now held by Nathan Mayo, who will not offer for another term. Buster will, if he runs, resign from Superior.

His background shows distinction in the agricultural field. Progressive Farmer named him Florida's man of the year in agriculture last year. He has been active in many statewide movements, and on appointive posts within the state.

Henry Scott has succeded the late Bart O'Hearn at the Denver office of Union Bag-Camp Paper, covering Utah, North and South Dakota, Wyoming, New Mexico, Colorado, Montana and parts of Nebraska, Kansas and Idaho. John Cox takes over in the Southeast, covering Mississippi, Alabama and part of Tennessee.

SCOTT COX

Appointment of Robert G. Hickle, left, as Manager, Southern area, agricultural chemical sales, and Richard L. Rahn as coordinator of agricultural chemical sales, was announced by the Collier Carbon and Chemical Corporation, manufacturers of Brea Brand fertilizer products. Both appointments are effective immediately, according to R. H. McGough, Manager, Agricultural Chemical Sales. Hickle formerly was Assistant Manager, Agricultural Chemical Sales; Rahn formerly was Supervisor, Solid Fertilizer Sales.



HICKLE RAHN

Zigler

John D. Zigler, general manager of the Plant Food Division of International Minerals & Chemical Corporation, was awarded a 25-year pin by the company's administrative vice president, Thomas M. Ware, at a recent luncheon meeting. Mr. Zigler joined IMC in 1933.

AAC

The American Agricultural Chemical Company has announced three personnel changes in its production department:

Roy Simm, former northeast division superintendent, has become responsible as manager of the engineering division. He succeeds S. Clifton Pruett, who retired February 28 after 45 years with the company.

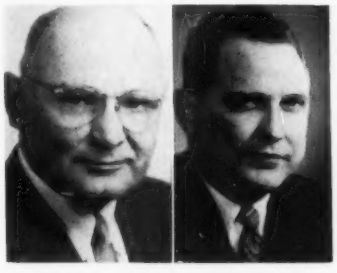
S. D. Ward, former superintendent of the Carteret, N. J. fertilizer plant, has become responsible for production in the northeast division, which includes plants at Carteret; Buffalo and Phoenix, N. Y.; North Weymouth, Mass.; Port Hope and London, Ont., and Fort Chambly, Que., Canada.

H. C. MacKinnon has become responsible as production superintendent at Carteret.

Whittington

Charles S. Whittington Jr., was named Leflore County's outstanding citizen by the Greenwood Lions

The Chase Bag Company has appointed George W. Williams, left, as acting manager, and E. M. Bond as sales manager, of its branch in Dallas, Texas. J. A. White, Jr., former manager for Chase at Dallas, died suddenly in New York of acute bronchial pneumonia on January 31. The promotions were announced jointly by W. N. Brock, vice president and general sales manager of Chase Bag Company, and J. H. Counce, Southern regional sales director in New Orleans.



WILLIAMS BOND

H. E. "Cotton" Graham mentioned here last month as new manager of the fertilizer division of Fort Smith Cotton Oil, Fort Smith, Ark. He came to them from Blytheville Fertilizer, Blytheville, Ark., with whom he was associated for 8 years.

GRAHAM

Jerry B. Davis who has been appointed to the staff of the National Plant Food Institute as editorial assistant, Dr. Russell Coleman, executive vice president, announces. The appointment is intended primarily to strengthen the work of the Institute in the field of visual aids. He fills a position on the Institute staff which has been vacant for several months. Mr. Davis comes to the Institute from the Agricultural Research Service, U. S. Department of Agriculture, where he was an information specialist.

DAVIS

Richardson Scale Company has announced the appointment of Howard Johnson as Southern regional manager, with headquarters at 423 Grant Building, Atlanta 3, Georgia, replacing Ernest C. Mott, who is retiring after 39 years with the company.

JOHNSON

Club. Mr. Whittington, president of the Mississippi Chemical Corp. and the Coastal Chemical Corp., helped organize the Cooperative Elevator Company in Greenwood last year and the Yazoo Valley Oil Mills Inc., which purchased and expanded the former Buckeye Cotton Oil Mill.

Perler

The promotion of Roy Perler, Yale industrial truck salesman in New York City, to Eastern Regional Sales Manager of Yale Materials Handling Division, The Yale & Towne Manufacturing Company, has been announced by Clyde R. Dean Jr., general sales manager.

In his new position, Mr. Perler will have sales management responsibilities for Yale industrial truck sales in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Maryland, Delaware, Virginia and Eastern Canada.

McNeil

Charlie McNeil of Jackson, known affectionately to farmers throughout the state as "Mr. Charlie," received a scroll of commendation for his long service to agriculture and the farmers of Mississippi at a banquet of the stockholders of the New Orleans Bank for Cooperatives.

Twenty-eight years ago, he was instrumental in organizing the Mississippi Federated Cooperatives at Jackson, of which he has served as general manager since. On March 1 of this year, Mr. Charlie turned over the helm of the group to his assistant and took on the job of management consultant.

Dyer

International Minerals & Chemical Corporation has named H. Clair Dyer district sales manager of special products in its Phosphate Chemical division. In his new position he will direct sales and sales development in a five-state area including Michigan, Wisconsin, Illinois, Indiana, and Kentucky.

Wilson

Louis H. Wilson, secretary and director of information of the National Plant Food Institute, has been elected an honorary vice president of the American Forestry Association "in recognition of outstanding contributions he has made and will continue to make in the field of natural resources."

Kelley

The directors of Zonolite Company, Chicago, have elected J. A. Kelley president, it was announced by A. T. Kearney, chairman of the board.

Mr. Kelley succeeds J. B. Myers, who resigned, but will continue his association with the company as a consultant.

Mr. Kelley joined Zonolite Company in 1946, and in his early tenure, was responsible for the development of the firm's extension mining and milling developments in South Carolina, and for the installation and operation of Zonolite plants in many cities in the South and Central South areas. He also managed Zonolite sales activities in these sections.

Owens-Illinois

Creation of three new positions in the multiwall bag division of Owens-Illinois Glass Co. has been announced by Tom W. Brown, Jr., newly-appointed manager of the division.

To assist him in sales and production matters, Mr. Brown named James C. O'Neal, Jr., as sales assistant, and William F. Connelly as production assistant.

William H. Morris was named product sales manager, and will handle various specialized areas of marketing. He is currently assigned to the promotion of insulation bags as part of the company's new emphasis upon production of that type of bag for industrial purposes.

CONNELLY

MORRIS

Lewis Morgan who has been assigned by Spencer Chemical to the position of technical service representative in the mid-South district, which includes Arkansas, Kentucky, Louisiana, Mississippi, Tennessee and Texas. He will make his headquarters at the company's Memphis Office. Mr. Morgan replaces Charles J. Major, recently transferred to the Southeastern District.

MORGAN

Potash Company of America has announced the appointment of Theodore Neeley as sales representative for Missouri, Nebraska, Kansas, Oklahoma, Colorado, and portions of the Kentucky, Indiana and Illinois territory. He will work, under the supervision of F. H. Kennedy, Midwestern sales manager, out of their Midwestern Sales Office, 517 First National Bank Building, Peoria, Illinois—Phone 6-7639. He has been with them since 1953, in the Carolinas territory.

NEELEY

Sinclair Chemicals has announced the appointment of James C. Lamb as sales representative, Nitrogen Products division, in Illinois, Wisconsin, and portions of Iowa and Minnesota, out of Rockford, Illinois.

LAMB

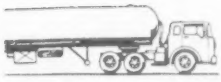
New from Sohio

the solution for granular fertilizers

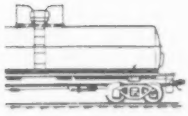
SOHIOGEN 16

(41.4% nitrogen)

saves up to $1.00 per ton in materials and manufacture



Sohiogen 16 . . . another pace-setting Sohio solution, developed by research, to match the fast changing scene in the fertilizer industry. And it's yours with a long list of benefits for granular manufacture . . .



- ★ **High fixed-to-free ratio — you can use more solution without over-ammoniation . . . require less acid neutralization.**
- ★ **Low salting out temperature — Sohiogen 16 is easier to handle and work with. Reduces storage problems. Low vapor pressure, too.**
- ★ **Produces hard granules — one size for ideal drillability, good storage. Minimum recycle ratio.**
- ★ **High nitrogen, low water content — reduces shipping costs, drying costs of finished goods.**
- ★ **Free-flowing, conditioned granules — result from perfectly adjusted Urea-Nitrate balance. Permits high solution usage with low moisture absorption of finished product.**

Sohiogen 16 has been tried and proved in full-scale, multi-plant manufacturing operations. Extensive tests show it can supply all of the nitrogen for granular fertilizers up to 12% — in some instances up to 15%.

For complete details call the "Man from Sohio" . . . see how new Sohiogen 16 can make money for you.

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WICKS

BACON

Deane F. Wicks, left, a veteran of the paper industry who has been named sales manager for the Raymond Bag Corporation, according to an announcement by J. R. Clements, President. He joined the Albemarle Paper Manufacturing Company, now Raymond's parent firm, in 1949. Succeeding him as Eastern district sales manager is T. H. (Ted) Bacon. Mr. Bacon has been connected with Albemarle for the past several years.

changes

Yale Shovel

Yale & Towne have set up a separate product sales department in the Philadelphia plant to handle the new industrial tractor shovel line being introduced by Yale Materials Handling division. Gerald A. Tamblyn, with 18 years in bulk materials handling, has been named salesmanager of the new line.

Pennsalt

Pennsalt Chemicals has sold its I. P. Thomas division, except for a 70-acre tract at Paulsboro, N. J. where the fertilizer plant is located, to Dixon Chemical Industries, Inc. The New Jersey tract has been leased to Dixon with an option to buy. President William P. Drake explained that it had been concluded that the manufacture and sale of commercial fertilizers "is not a logical field of specialization for Pennsalt."

AP&C

American Potash & Chemical has opened at Shreveport, La., a South-Central district sales office to handle Louisiana, Mississippi and parts of Alabama, Texas, Oklahoma and Arkansas. William W. Young has been named salesmanager of the branch, and Niven D. Morgan has joined the company as representative operating out of the new office. Mr. Young has been with them since 1949, working in the Southern area.

Cynamid

North American Cyanamid Ltd. has changed its name to Cyanamid of Canada Ltd., to better express the pronounced trend toward integrated Canadian operations. Actually the company has been manufacturing in Canada for more than 50 years, beginning with a single product and developing into a wide range of chemicals. Headquarters of the renamed unit, headed by the recently elected president, Dr. L. P. Moore, will be established in Montreal. It is planned to develop centralized management there, with emphasis on Canadian personnel to manage the Canadian operations.

Monsanto

Monsanto Chemicals, Australia, Ltd. has purchased all outstanding shares of two Drug Houses of Australia units,—Beetle Elliott and DHA Chemicals. The former produces sulphuric, and a number of agricultural chemicals. This is a step in the development of the Monsanto Overseas Division, reported here recently. The overseas unit is headed by Marshall E. Young.

Guano

Purex Corp., California, has been assigned the selling of bat guano mined from the Grand Canyon by U.S. Guano Corp., subsidiary created for the purpose by New Pacific Coal and Oils, which expects an operating profit of around $300 per ton, according to president Frank E. Rubens.

Meyer

Wilson & Geo. Meyer & Co., Western distributor of agricultural and industrial chemicals, has planned ceremonies for April 2 to dedicate the firm's new offices, warehouse and bulk storage facility at 2060 Garfield Avenue, Los Angeles.

The new facility, costing $500,000, doubles the Meyer firm's former Southern California space at 4800 District Boulevard, which it occupied only seven years ago. The enlarged plant was necessitated by the rapidly growing demand throughout the West for fertilizers, and other materials which the firm distributes. Among the firms and products which the Meyer Company represents are Eastman Chemical Products; Stauffer Chemical Company and Western Phosphates, Inc.; Norsk Hydro; and Canadian Peat Moss Co.

The 108-year-old Meyer firm also has district offices in San Francisco, Portland, Seattle and Salt Lake City.

IMC Opens New Research Lab.

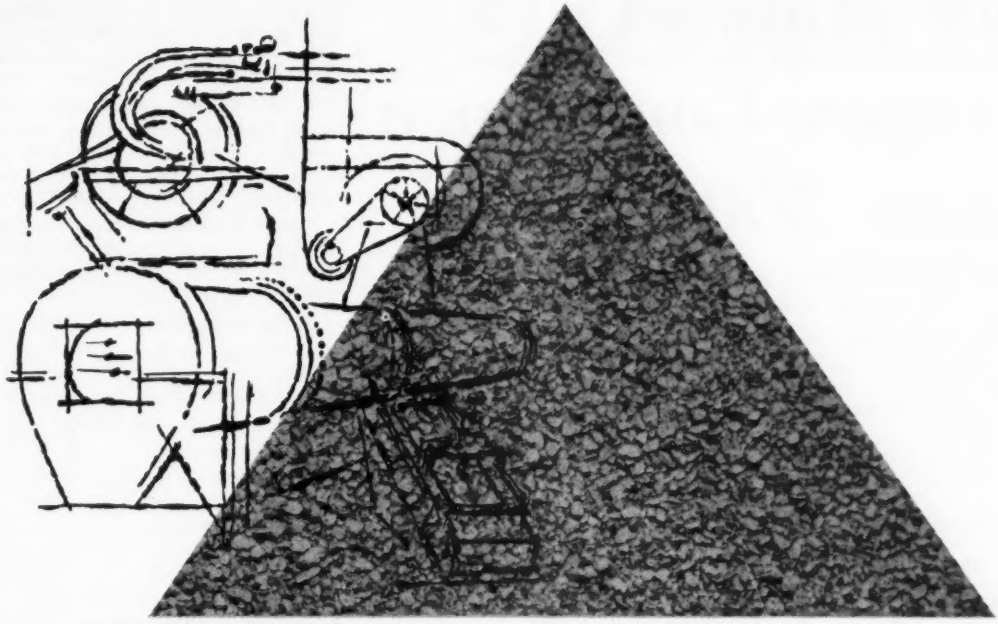
The Bartow, Fla., research laboratory designed to "capitalize to the fullest on today's rich new opportunities in minerals" has been put into operation by International Minerals & Chemical Corporation at its experimental research station in Mulberry, Fla.

Dr. I. M. LeBaron, IMC research vice president, said at the opening that the new mineralogical lab, unique in the mining industry, would allow full-range mineral investigations, from studying composition of new-found ores to checking out the economic soundness of mining and marketing them.

The new laboratory group at Mulberry brings to 74 the total of scientists and technicians on the IMC research staff there. Elliott Northcott, manager of the station, says the complete staff skills include mineralogy, metallurgy, mineral processing, inorganic chemistry and chemical engineering. Eight Ph. D. and 11 masters degrees are represented on the staff, which has a total of 235 years of college training and 350 years of post-college experience in the fields represented.

The Florida station handles about 50 percent of the company's total research program, some of which was shifted from the main research laboratory at Skokie, near Chicago. The Florida station handles inorganic chemistry, chemical processing and engineering, minerals beneficiation, and mineralogy; Skokie handles organic, biological, agronomy and food products research.

The Mulberry station has 15 pilot plant and sub-pilot plant facilities, flexible enough to permit duplicating most of the company's commercial production facilities.



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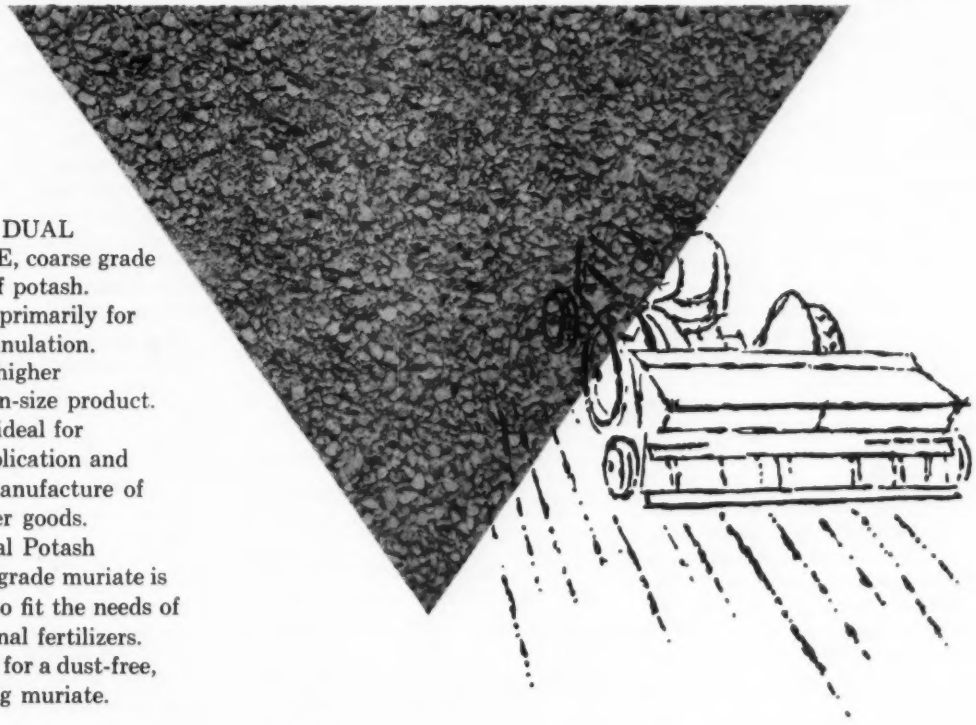

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National Potash standard grade muriate is designed to fit the needs of conventional fertilizers. Processed for a dust-free, non-caking muriate.

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Upper Midwest Nitrogen Conference Attracts 500

A star-studded program attracted more than 500 to the meeting held in late February at St. Paul, Minn. The meeting was co-sponsored by the Minnesota fertilizer industry, NPFI and the soils department of the University of Minnesota.

A talk of general industry interest was made by a banker, Richard Bird, who told of his work with farmers, and made the vital point that a country banker must be prepared to string along with farmers over a long period. As he said, a fertility program cannot be accomplished overnight, but is a project running, not four or five years, but for the duration of the farmer's tenure.

Taking our farm lands for granted could, in a few years, cause world-wide catastrophe.

George D. Scarseth, American Farm Research Assn. director, as keynoter stressed the fact that it should be easy to sell the use of nitrogen: "There is much evidence to show the profitableness of using adequate nitrogen in balance with other top practices to lower the cost of production," Scarseth said. "Lowering the cost of production is one way to broaden its acceptance in the market."

He pointed out that lack of nitrogen is one of the first limiting factors in crop growth in the Midwest. "We have built a highly productive agriculture based on mining our soil for nitrogen, a capital wealth which was really inherited from virgin land," he said. "Legumes have tended to delay this day of nitrogen starvation, but they have taken their expensive toll in depleting our soils in phosphorus, potassium and other mineral elements.

"Therefore, we can no longer depend on inherited nitrogen from organic matter and in many places it will not be economical to depend on nitrogen from legume sources."

Knowledge of the product by salesmen and product performance make up the best sales tools for fertilizer, a California agronomist said here today.

M. H. McVickar, agronomist for **California Spray Chemical,** told the conference that "It's time we sell results, or profits—not pounds of nitrogen.

"The old and still used approach of cost per ton or pound of fertilizer must give way to stress on the farmer's return on investment." He stressed the need to make "yield per acre and cost per ton of fertilizer secondary to return on investment" so that the fertilizer industry "will become of age and take its proper place as a chemical industry."

"Service selling—how much to use, when and how to apply for greatest profit—is of real value to the farmer. Such service costs money, but it makes profits for the farmer," McVickar said.

J. M. MacGregor, University soils scientist, said that farmers looking for ways to avoid the soft corn problem in the future won't help it any by applying less nitrogen fertilizer.

The President says: "Agriculture has changed more within the lifetime of persons now living than in the 2,000 years preceding."

In fact, nitrogen is more likely to be a help where the high-moisture corn problem is concerned.

Field tests at the University of Minnesota in recent years have shown that average ear corn moisture in late September is about the same in corn receiving heavy nitrogen doses as it is in corn receiving either no fertilizer at all or a no-nitrogen fertilizer.

Actually, proper fertilizing can help avoid a soft corn problem, MacGregor said. He reasoned this way: Excessive moisture often results from corn freezing before it matures. Corn plants that receive an adequate supply of plant nutrients will grow faster and therefore will be more likely to get ripe before the first frost.

R. A. Young, agronomist from **North Dakota State college,** pointed out that yields of small grains are "considerably below potential levels" in the Upper Midwest.

"Many controllable factors are involved,' he said, "and an important one is the supply of available nitrogen in the soil."

In North Dakota, he reported, the state average yield of wheat—much of which is grown on fallow land—was 18.8 bushels per acre in 1957.

"During this same year," Young said, "average yield of wheat from the best treatments in 19 fertilizer trials on non-fallow land was 34 bushels per acre."

Results of nitrogen fertilizer trials on non-fallow land from 1948-57, he reported, indicate that "a 25 to 30-pound application of nitrogen is a good average recommendation on non-fallow land in western North Dakota and that 30 pounds or more should be used in the eastern part of the state."

Laurie Peterson, Midland Cooperatives, Inc., Minneapolis, said "a certain amount of teamwork is necessary to achieve our common objective. The fertilizer manufacturer is really the 'captain' of the team, with many responsibilities."

The most important link in the distribution team, Peterson said, is the fertilizer dealer, because he makes the all-important contact with the farmer.

The fertilizer dealer program he offered included these points:

1. Offer a complete fertilizer service, including bagged fertilizer, bulk fertilizer spreading service, and side-dressing or a preplant program with either ammonium nitrate, nitrogen solutions or anhydrous ammonia.

2. Sell a sound fertility program. This includes promoting soil tests, planting adapted seed varieties, stepping up corn plant populations, liming where necessary, fertilizing according to soil test, controlling insects and weeds and applying preplant or side-dress applications of "straight nitrogen" material.

3. Set up a training program for dealers, employees and salesmen, so they understand the products and how to help farmers get maximum return from their fertilizer dollar through wise use.

4. Advertise, by following up fer-

tilizer company advertising with local advertising.

5. Merchandise the material in the store, with fertilizer displays, bulletin boards, taking orders in advance, keeping card files for each patron.

6. Set up demonstration plots to sell fertilizer.

Dr. W. P. Martin, head of the **University of Minnesota Soils Department,** heading a panel on "Our Part in Getting the Job Done," stressed the value of cooperation between colleges and industry in research work.

Historically, the Land Grant colleges have been the organizations through which agricultural research was done, Dr. Martin said. Colleges need to have a greater appreciation and understanding of industry's role in research and selling; and conversely, industry needs a greater understanding of the colleges' role. The sum of their combined efforts is considerably greater than the total of their individual efforts, he added.

Skuli Rutford, director of extension, **University of Minnesota,** said it has been the responsibility of extension to serve the farmer. Such service requires effective cooperation with all the elements who work with and for farmers at the county, State and national levels.

Proctor Gull, Spencer Chemical Co., stressed that teamwork is needed between colleges and industry to help foster research, to develop usable facts from research, and to sponsor promotional work to put those facts to work on the farm.

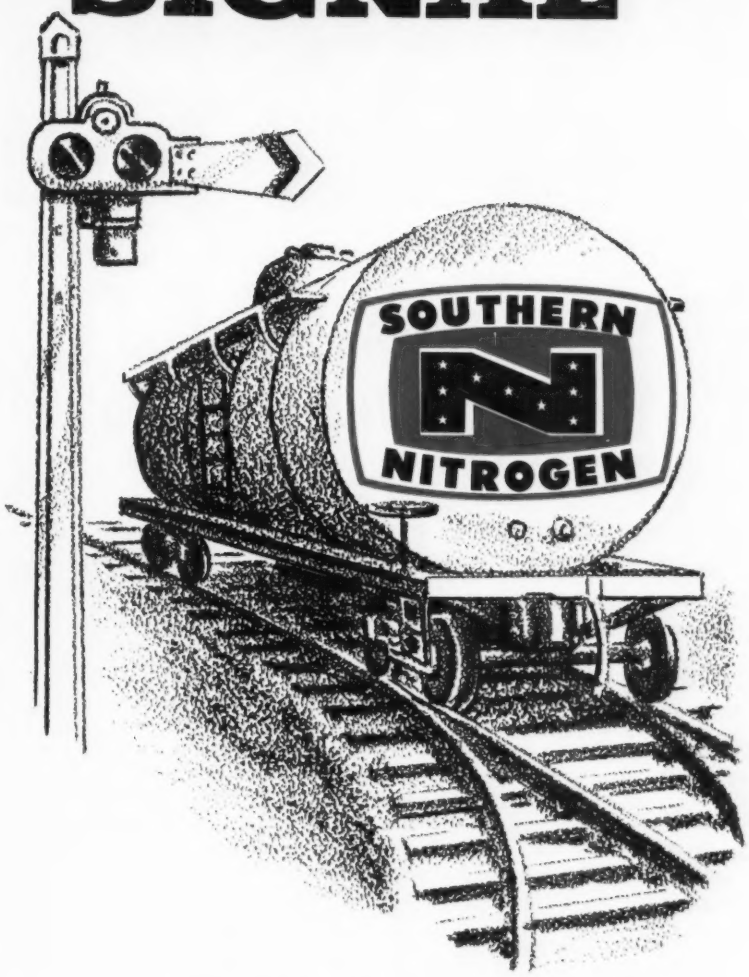
Dr. A. C. Caldwell, University of Minnesota soils scientist, reported that important as nitrogen is, it returns the biggest dollar profits to the farmer who makes sure his soil also has plenty of other nutrients—phosphate, potash and lime.

Discussing "Crop Production Possibilities for Minnesota Soils," **Ermond Hartmans,** farm economist and **Charles A. Simpkins,** soils specialist of the University, said that by wisely applying fertilizer and adopting better management methods, Minnesota farmers would almost triple their net return from field crops.

Hartmans and Simpkins said that in a 27-county area of South Central Minnesota, net returns from all crops could be increased from the present $8 to $20 per acre.

Co-chairmen of the meeting were **Dr. W. P. Marlin** and **J. W. Hicks,** Mr. Hicks is with International Minerals and Chemicals Corp.

SIGNAL



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Some of the speakers present at the Montana fertilizer dealers meeting (left to right): J. O. Reuss, assistant in soils; Dr. A. H. Post, head of Soils and Agronomy Dept.; A. F. Shaw, extension agronomist; F. T. Tremblay, National Plant Food Institute; and Harry Kittams, assistant soil scientist.

Montana Association Holds Dealer Meeting

At a well-attended meeting at Montana State College, Bozeman, fertilizer dealers heard the latest information on fertilizer recommendations from a variety of experts. The meeting was sponsored February 11-12 by the newly formed Montana Plant Food Association.

Dr. A. M. Post, head of the Department of Agronomy and Soils, discussed fertilizer potentials on forage crops in Montana. At present there are 2,410,000 acres of forage crops in the state, of which 1,073,000 acres are irrigated. The irrigated hay crops include 257,000 acres of timothy and clover, 561,000 acres of alfalfa, and 250,000 acres of pasture. These crops have a minimum potential of 100,000 tons of fertilizer. At the present time, the total fertilizer tonnage in the state on all crops is approximately 35,000 tons. Dr. Post stressed the need for quality of forage crops, as well as yield per acre. He suggested that ample quantities of phosphate should be added with nitrogen to forage crops to keep the phosphate content of the forage at optimum levels.

Harry Kittams, assistant soil scientist, discussed the alfalfa leaf analysis survey conducted in a number of areas in southwest Montana. His figures indicated that 28% of the fields sampled were low in phosphorus and 8% were low in potassium. 38% of the fields sampled were medium in phosphorus and 33% were medium in potassium. It is very likely that a paying response to fertilizer applications would be obtained with fertilizer treatments on these fields. 130,000 acres of alfalfa were included in the survey. Mr. Kittams stated that if a minimum application of P_2O_5 was applied to the fields needing the phosphate, about 8000 tons of treble super would be required.

Drs. Murray Klages and Paul Brown emphasized the importance of soil moisture on fertility requirements of wheat in eastern Montana area. Good fertilizer responses to nitrogen and phosphate can be expected where soil moisture at planting time extends to a depth of 3 feet or more, and where a reasonable amount of precipitation falls during the growing season. Experimental work is being continued to pin point fertilizer recommendations to suit moisture conditions in the various areas.

J. O. Reuss and D. E. Baldridge emphasized the need of a high fertility program for corn grown for silage. They suggested the use of about 7 lbs. actual N, and 2 lbs. actual P_2O_5 per ton of silage produced. Yields of corn silage upwards of 40 tons have been obtained under conditions of good management on irrigated Montana soils. The use of corn as a silage and grain crop is becoming more and more popular with farmers in the area because of greater net dollar returns per acre.

F. T. Tremblay, Northwest representative of National Plant Food Institute, emphasized the importance of soil testing and demonstration plots in promoting the proper use of fertilizers. Fertilizer dealers were urged to cooperate with the State College personnel to put the fertilizer story across to the farmers.

Prior to the fertilizer dealers meeting, the Montana Plant Food Association held their first annual meeting at Montana State College. President Art Wolcott of Farmers Union Central Exchange presided over the meeting which was attended by approximately 20 distributors and manufacturers representatives serving the Montana area. One of the important amendments to the constitution passed was to allow dealers to become voting members in the association. Newly elected officers were: President, Dean Travis, Jr. (J. R. Simplot and Co.); Vice President, George Mason (Montana Flour Mills); and Secretary Treasurer, Ray McGregory (Phillips Chemical Co.). The organizational meeting for MPFA was held last June at Great Falls. The organization was formed for the prime purpose of promoting the proper use of fertilizer in the state.

Connecticut Field Day To Be Streamlined

Scientists at The Connecticut Agricultural Experiment Station have analyzed a hardy perennial, the Station Field Day, and decided to prune, top-work, and rejuvenate it in '58.

The botanists and geneticists claim that Field Day has come into flower on the wrong day, and a new time has now been built-in—Saturday, August 16. The Station climatologist agrees to this timing, with a flat, or nearly flat, prediction of 5 chances in 10 for a fair day.

The entomologists, wise to migratory habits, report that the center of activities at Field Day has been in the wrong spot for lo these many years. So the Field Day tent will be erected on higher ground, at the hub instead of the rim of activities. In this decision the ecologists concur, because the heart-lifting view from the new site should keep speakers in fine fettle. Guests can also rest, at a respectful distance, in a chestnut grove. Burrs are still on the trees in August.

Winners Named in Forage Contest in Virginia

Six Virginia counties will receive trophies in recognition of their outstanding 12-month forage programs during the last year, announces John F. Shoulders, pasture specialist at VPI. The trophies are furnished by the National Plant Food Institute which cooperates with the VPI Agricultural Extension Service in the program.

During the year ending July 1, 1957, more than 42,000,000 tons of phosphate ore came out of Florida mines to produce sales at the mines amounting to $65,474,000 . . . 10,410,000 marketable tons . . . 74% of the national volume.

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300 Expected At The 6th California Conference

300 persons interested in soil fertility and plant nutrition will attend the Sixth Annual California Fertilizer Conference on April 14-15, on the campus of California State Polytechnic College at San Luis Obispo, according to the California Fertilizer Association.

Sponsored by the association's soil improvement committee, this conference will attract fertilizer company management; agronomists serving the industry; fertilizer salesmen and dealers; farmers and ranchers; technicians of the University, the USDA, and the California Department of Agriculture; testing laboratory personnel; and field men of the agricultural processors of the State, among others.

Dr. Alfred M. Boyce, director of the Citrus Experiment Station, Riverside, will be the featured banquet speaker. Conference co-chairmen are J. H. Nelson and Earl R. Mog, both of Stockton.

PROGRAM

Monday, April 14, 1958

9:00 a.m.

Opening remarks—William G. Hewitt, President, California Fertilizer Association, Berkeley

9:05 a.m.

Welcome, by Julian A. McPhee, President, California State Polytechnic College

9:15 a.m.

"Soil Compaction and Soil Conditioning"—Dr. D. G. Aldrich, Jr., Chairman, Dept. of Soils and Plant Nutrition, University of California, Davis

9:40 a.m.

"Results to Date of Range Fertilization Demonstrations" — Dr. Logan Carter, Head, Dept. of Soils, California State Polytechnic College, San Luis Obispo

10:15 a.m.

"Rapid Determination of Sulfur in Plant Materials for Diagnostic Technique" — Dr. Clarence M. Johnson, University of California, Berkeley

10:40 a.m.

"Soil Salinity and Fertilization"—Dr. Roy L. Branson, University of California, Riverside

11:05 a.m.

"Fertilizer and Pesticide?"—Robert Z. Rollins, Chief, California Bureau of Chemistry, Sacramento

11:45 a.m.

Take buses for tour of range fertilization demonstrations. Outdoor luncheon will be served at first ranch stop, featuring charcoal broiled steak.

7:00 p.m.

Banquet, Edna Farm Center Hall, just south of San Luis Obispo, featuring roast prime ribs of beef.

"Farmers Attitudes Toward Use of Fertilizers" — Dr. Richard B. Bahme, Western Representative, National Plant Food Institute, San Francisco

"Co-operative Relations in Agricultural Research Between Industry and the University of California" —Dr. Alfred M. Boyce, Director of the Citrus Experiment Station, Riverside.

Tuesday, April 15, 1958

9:00 a.m.

Two groups of delegates of equal number will take part in two panel discussions, with the panels rotating between the two adjacent audiences.

Panel on Range Fertilization: Moderator—P. Curtis Berryman, Director, San Luis Obispo County Agricultural Experiment Service, San Luis Obispo; panel members —M. S. Beckley, Santa Clara County Farm Advisor, San Jose; Lyman Bennion, Head, Animal Husbandry Dept., Cal-Poly, San Luis Obispo; Dr. Logan Carter, Head, Soils Department, Cal-Poly, San Luis Obispo; Russell R. Helphenstine, Farm Advisor, San Luis Obispo County; Dr. R. Merton Love, University of California, Davis; George Park, Rocca-Cuvi, Inc., San Francisco

Panel on Crop Response to Sulfur: Moderator—R. L. Luckhardt, Collier Carbon and Chemical Corporation, Brea, California. Panel members—Dr. Lester J. Berry, University of California, Davis; Dr. Clarence M. Johnson, University of California, Berkeley; Dr. William E. Martin, University of California, Berkeley; Dr. Victor V. Rendig, University of California, Davis; Dr. Albert Ulrich, University of California, Berkeley; John B. Wasson, United States Gypsum Company, Los Angeles.

Nelson and Mog urged all persons interested in soil fertility and plant nutrition to attend. They said that no registration fee will be charged, and that complete information may be had by inquiring at the California Fertilizer Association, 475 Huntington Drive, San Marino 9, California.

Data Asked On Martian Plants

The Connecticut AES, which is not often caught napping, was completely unprepared for a recent request: A list of plants suitable to grow on Mars. Very seriously, an 8th grader, who has temporarily abandoned his rocket work, is planning to duplicate under glass the agricultural conditions on Mars, and see if he can grow suitable crops. And the station with equal seriousness is giving him the best advice they have on the subject. By the time he grows up, this kid may well be an important authority on what then may be an important subject.

And to add to this, we read a memo from the famous Spuds Johnson of Florida's Gainesville AES, who is thinking along the same lines. He says space ships will carry plants to help use up the carbon dioxide, and that human colonies on Mars may well be little terrariums (people may live under glass domes). So the Kid from Connecticut isn't a bit silly, just a long jump ahead of his time.

"Plant America!" Suggests Plant Feeding

The American Association of Nurserymen are now conducting their 6th annual industrial and institutional landscaping competition. This encourages factories and other often ugly building folks to beautify.

We mention it here because it is another phase of the specialty fertilizer field, which we believe can be made to grow from its present estimated 10% of the tonnage to a segment of the industry well worth our time and effort. Encouragement by our own people, who can often set an example by dressing up their own plants, might be a big help.

People Beat The Machine

In the detection of minute concentrations of certain chemical people are better than any instrument ever devised, they find at New York's Cornell AES . . . but the people get tired and the machines don't.

An air view of the surface installations of the mine near Saskatoon, Canada being developed by Potash Company of America. Tall building, left is head of mine shaft. Nearer is framework for surface production plant. Bins in foreground are for storage of muriate of potash.

PCA Soon to reach 3000-foot level in Saskatoon shaft

As we have reported from time to time in "Around the Map" the Potash Company of America is making excellent progress with its mine at Saskatoon, Canada. This operation sits at the top of a shaft which is slated soon now to reach the 3000 foot depth where the potash is located.

A recent report by president G. F. Coope to Potash Company stockholders will be of interest to our readers:

"Progress Report on Canada"

"As we enter 1958, the year which we hope will see the completion of our mine development and surface construction program in Saskatchewan, it seems appropriate to give an account of what has been accomplished to date.

"In order to give a clear and complete picture, it will be necessary to go back several years. Your management has been aware that depletion of our orebody at Carlsbad has been proceeding at a rapid rate because of increasing production. Although this situation has not approached a critical stage, it was felt that an important obligation of mining management was to do everything within reason to insure ore reserves not only for the next twenty years or so but for a very long term.

"We have for some years conducted exploratory drilling in an area some 20 to 30 miles east of our present Carlsbad operation, and have succeeded in developing a very large potash deposit of lower grade than the orebody we are now mining. This was felt to give us a good deal of insurance for future operations.

"However, we felt that there were possibilities in Canada that needed careful investigation. Over ten years ago, we checked on the information available on potash encountered in wells drilled in western Saskatchewan, in vicinity of Unity. It was our decision that the grade of the deposit indicated and the engineering problems and natural difficulties involved made a project in that area unattractive. Some five years later, during which time we had continued to gain such information from oil well drilling in Saskatchewan as was available, we decided to resume exploration there. From the gamma ray logs (indicating potash) which we were able to obtain from oil companies, we determined that a core drilling campaign was justified and this was commenced. We drilled holes across the greater part of the province east of Saskatoon, for various reasons decided that the area near that city was the most favorable, and concentrated drilling there to develop an orebody.

"The result of this drilling was to show a very large potash deposit of high grade—better than Carlsbad—and good thickness. It was in fact of such a nature that it demanded the most careful consideration. Its depth of over 3,000 feet and the weak and water-bearing overlying sedimentary beds posed serious engineering problems in shaft sinking and future operations. In order to get the best information and advice on these matters we sent our engineers to Europe and Africa, and brought consultants to this country. It was decided that the venture was justified.

"Much had to be done outside of the routine operations of shaft sinking. We drilled a ring of freeze holes and froze the ground to a depth of 3,000 feet before starting to sink. However, before doing this we had among other things to develop and agree with the Provincial officials on lease and royalty regulations, with Dominion officials on taxation, with railways on freight rates and with the power company on supply and prices. We found ourselves involved with friendly and helpful people.

"An incentive for locating in Canada was the policy of the Dominion government of attracting capital to development of the Canadian mining industry through an exemption from income tax during the first three years of operation. This policy enables investors to recover at least a very substantial part of their original investment during this three-year period, depending on operating efficiency. Since potash was not included in such tax exempt mining ventures, your company brought this to the attention of the proper Dominion officials who promptly recommended the inclusion of potash in the exempt classification. The Canadian Parliament, in line with their policy for encouragement of mining ventures, acted favorably on the recommendation.

"At the present time (February 11) the shaft is down more than 2600 feet with several hundred feet left to go and what was considered the most difficult ground behind us. We are aiming at June completion. As you can see by the aerial view of the surface plant, this is well along, with all excavation and major concrete work finished, some of the buildings housed in, and most of the steel work for the main concentrator structure erected. Our schedule is for completion in November of this year.

"We realized the hazards and difficulties of this work when we undertook it, and we will undoubtedly encounter additional problems. However it would seem that we may anticipate a technically good and financially profitable operation. The contractors for our surface plant are Stearns-Roger Engineering Company, the most experienced in the field, and our underground setup should also be a highly developed one. Freight rates to most of the United States will be the same as those from Carlsbad. Canada itself is a relatively small consumer. We should have a line of products which should be in a very good competitive position. And what is indeed important to a mining operation, we shall have available a mineral deposit of tremendous extent and high quality, removing for all practical purposes, any concern about reserves for a century or so."

IDAHO

Central Farmers plant at Montpellier is reported 25% complete. It is expected to be in production by Fall, turning out its engineered production of calcium meta-phosphate, being rated at 120,000 annual tons, plus up to 180,000 annual tons of acidulation grade phosphate rock. Consideration is being given to production of ammoniated calcium metaphosphate. All output is intended for shipment to the 14 mid-West farm organizations which jointly own the operation. The plant is adjacent to a phosphate lode 100 feet wide and five miles long, which are calculated to last 80 years on the surface alone, with plenty in reserve to 900 feet or more depth. But for the present open pit mining will take care of needs.

* * *

North Idaho Chemical are doubling their storage capacity, building a structure to handle 1000 tons. Manager **Charles Fite** says plans have also been made to add new machinery that will double present plant manufacturing capacity of 3000 annual tons at the Lewiston facility.

ILLINOIS

Moweaqua Liquid Fertilizer Co., 4 miles northeast of Moweaqua, has opened a liquid fertilizer plant, using a modern reactor with 10 hourly tons capacity. In their announcement they make some editorial-type comments which would do well in any farmer's lexicon: "We believe the best way to make our communities prosper is by raising the most bushels at the lowest unit cost,—and leave the ground as good or better than before." Another quote: "No fertilizer is a cure-all. It is not a substitute for adequate rainfall, proper application of limestone, or good general farming practices." These, we think, are good people to watch.

* * *

Steve Turner, Pontiac, is going strong with the little paper he publishes. "Steve's Corner" this issue contains a comment we think worth reprinting here:

"Wanting to see what Ray Ramy's place of business at Mankato is like, The Petersons at Minneapolis, Farmer's Seed and Nursery at Fairbault and a few others and not wanting to ask any of our boys to take the responsibility of picking up a $2,000.00 truck load of oats and just plain wanting to get away, I put on some heavy underwear, a dirty pair of overalls and an old cap and set out on what was an interesting adventure.

"And if you don't think you'll have interesting experiences traveling 1350 miles in a truck for four or five days, try it some time.

"If you think there is no class distinction in America and that every one enjoys complete freedom and equality you put on old clothes and get into a truck.

"**You** find out how many night drivers refuse to dim their lights because it's a truck they're meeting.

"**You** find out what it feels like to go into a good hotel and be greeted with— "Sorry, no vacancies."

"**You** go into a nice restaurant and see how apparent it is that you get a back seat in the corner.

"**You** stop at a 'truck stop' for a cup of coffee and hear the truckmen talk about 'management.'

"**You** drive up to a place of business at 7 a.m. as the 'labor' is coming to work and see how friendly you're greeted—'How are the roads, bud?' 'How long you been out?'—Then how chilly the reception is from 'management' which arrives at work around 8:30 a.m.

"All in all it was an enjoyable experience and should a similar opportunity be available again it will be accepted."

MISSISSIPPI

Mississippi Chemical should have completed the $2,000,000 additional construction that has been going on at Yazoo City, according to executive vice-president Owen Cooper. Construction of the new nitric acid plant and addition to the ammonia plant marks the third time the "world's first farmer-owned N plant" has expanded . . . not to mention the . . .

* * *

Coastal Chemical plant at Pascagoula, where the Farm Credit Administration governor, Robert B. Tootell, turned the first spadeful of earth March 3 as a beginning of the $16,000,000 ammonia operation. Chemical Construction Corporation is doing the construction job. The plant will join with Coastal's present facilities to make one of the most complete of plants.

The ceremonies were presided over by Charles S. Whittington, president (about whose recent honor see People in the Industry, this issue). City, County and Port Authority officials took part.

Coastal is a subsidiary of Mississippi Chemical.

* * *

The Salmon Sales Company, located near Clarksdale, Miss., are in the midst of expanding their liquid fertilizer plant. The modernization job of this 50,000 gallon unit is being engineered and installed by the J. C. Carlile Corporation of Denver.

MISSOURI

Farm Bureau Service Co. is building a new $50,000 bulk fertilizer plant at Delta, which should soon be going into operation. The structure is 62 x 82 feet, with 800 tons of storage capacity.

NORTH CAROLINA

Dixie Guano, Laurinburg, March 6 suffered a fire which destroyed two storage buildings and damaged a third. Tractors, trucks and other heavy equipment, plus lumber and tanks were also destroyed by the fire, to the extent of $50,000 damage.

OHIO

Nitrogen Division's expansion program at South Point, which will increase capacity to 110,000 annual tons, which will then equal their Nebraska operation, we are told will make them the nation's largest urea producer.

* * *

Diamond Alkali, Cleveland, in order to provide more service on existing products, are expanding their market research activities.

* * *

A. A. Fishbaugh and Son, Celina, has installed a 30,000 gallon tank for anhydrous ammonia, and will sell applicators and deliver to farms in tank trucks.

American Agricultural Chemical has in operation more than half a million dollars of new equipment in its Washington C. H. plant, and can process three thousand weekly tons of fertilizer with 46 workers in 17 hours of 2 shifts. This is the final plant of Agrico's 20 plants centered in the midwest to be equipped with granulation equipment. A new storage and shipping building replaces one which was destroyed by wind as it neared completion last spring.

OREGON

Pacific Supply Cooperative will build a one-story warehouse and fertilizer plant at Portland on the site recently purchased for $136,000 facing the Willamette River, and with deep-water docks. They feel they will operate more efficiently in this than in the present 3-story structure.

VIRGINIA

Halifax Lime & Fertilizer Service, Inc., Halifax, has been chartered with $50,000 capital. James E. Edmunds is agent.

WASHINGTON

Allied Chemical & Dye expect completion of their Anarcortes sulphuric acid plant adjacent to the Shell Oil Refinery by Summer. Fluor Corp is building the plant for Allied and an alkylation unit for Shell.

* * *

Kerley Chemical Corp. began production last month in their fertilizer and soil conditioner plant at Kennewick.

INDIA

The Indian Government is working on a policy which may permit the establishment of three new fertilizer plants in the "private sector" in addition to the three already authorized for the "public sector." Decision is expected soon and it is felt that by early next year India will be in full swing with the new program.

IRAN

Kermanshah, wants to build a nitrogen fertilizer plant of 100-200 daily metric tons, to be financed from Government loan funds, and wants US firms to figure on a turnkey job. Write the President of the Kermanshah Chamber of Commerce if you're interested.

PAKISTAN

Pakistan Industrial Development Corp. has signed to build a 100,000 annual ton urea plant with Japanese firms, it was revealed in Hong Kong recently by Hideo Shirai, managing director of Shin Mitsubishi's heavy industry outfit. Both governments must ratify.

TURKEY

Turkey's State-operated plant has doubled capacity to 22,500 metric tons, while at Iskenderun the privately owned 100,000 ton plant is under construction and making good progress. Thus Turkey's potential production is now to be rated at around 250,000 tons.

China's Agronomists In Production Panic

A lowered death rate and increased birth rate which is boosting the population of Red China by 15,000,000 a year has them in a tizzy because these people have to be fed. This calls for cultivation of every available acre, and superhuman expansion of irrigated and reclaimed acreage.

Sweden's Waste Land Becoming Rich Forest

Fertilising moors and other unproductive soils in order to make them suitable for forest cultivation is one of the new methods being tried out by the Swedish Cellulose Company. This company is the owner of vast forest districts in northern Sweden, but these, however, are interspersed with waste-lands and bogs. If these latter areas could be made to produce forest there would be a two-fold gain to the owners: the additional raw material and the economies to be effected from concentrated cutting districts.

Using a method that has been tried out in similar areas in northern Norway and which has yielded good results in the ten years that it has been tested, the Swedish Cellulose Company has made experiments with various chemical fertilisers, leaving untreated spots for control. Balanced manure, Thomas phosphate, nitrates and other fertiliser types, single or in combination, are being used and comparisons will be made after the seedlings have rooted themselves.

By first draining the bogs and then fertilising them the company expects to release the food reserves that have been stored in them for a considerable time and thus, maybe obtain exceptionally productive forest stands.

Besides being applied to bogs, the method is also being tried out in some other connections, such as for shelterwood crops, for stimulating the growth of natural regeneration and for reducing the dying-off of young plants at the Swedish Cellulose Company's plantations.

A similar process to that expected in the bog-lands is hoped for in the shelterwood nurseries, where the moss mat will be changed more quickly into a germinating bed suitable for self regeneration.

New Booklet From General Metals

General Metals of Greensboro, N. C.—fabricators of steel, aluminum and stainless steel and manufacturers of metal products—are offering a free copy of their new Bulletin 201 giving information on their facilities, products, personnel and other general information.

Pictures in the bulletin show the wide variety of products that have been made by General Metals including a complete line of equipment for handling liquid fertilizers, all the way from storage tanks to field applicators. Free copies of the Equipment and Facilities Bulletin 201 may be obtained by writing Charles G. Monnett, sales manager, General Metals, Inc., Greensboro, N. C.

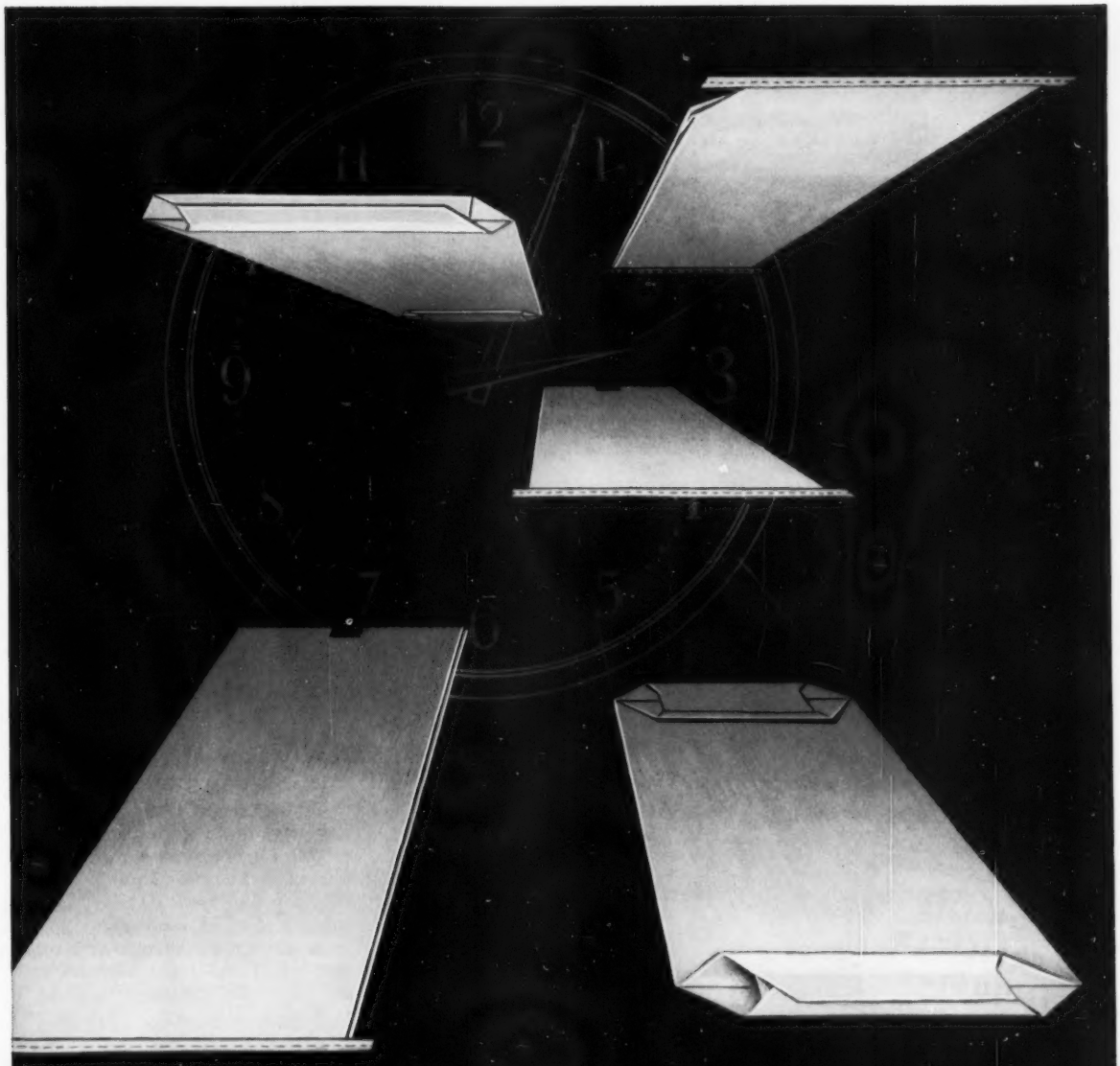
U.S.S.R. Admits Second Place

The Soviet Union plans a substantial expansion in its chemical industry over the next few years.

In overall chemical production the U.S.S.R. ranks itself second to the United States but production of many chemical materials, including fertilizers, is far below Russia's domestic demand.

Crop Chemical Shoos Bees

Nobody who knows about the birds and the bees would dream of putting out a bee poison, so it is a relief to know that the new bee-repellant is working. Oklahoma AES report that hydroxy-ethyl-tertoctyl sulphide gets across to the bee that a treated field is not safe to enter. It keeps bees out of fields freshly-sprayed with insect poisons for a period of 8 to 48 hours.



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FAO World Review Of Fertilizer Data

The 1957 version of the "Annual Review of World Production and Consumption of Fertilizers" has been produced by the Food and Agriculture Organization of the United Nations, and is now available at $1 per copy. US sales agents for all FAO publications are Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y.

The review covers data from governments received up to September 23, 1957 and supplies data on both production and consumption of fertilizers throughout the UN nations, broken down by sources and consumption area, with data on NP and K.

Dr. Vanderford Textbook For Modern Farms

Dr. H. B. Vanderford, Mississippi State, believes the modern farmer needs to know a lot of things that have not been in the textbooks. So he has written a 378 page book, published by John Wiley and Sons, New York City on Managing Southern Soils.

The book is intended primarily for students in vocational agriculture, and to give them the foundation they need these days in soil management. It contains many quotable items. He feels every farm should have a schedule or plan of operation. More fundamental, he gives good advice on how to buy a farm—and then how to build it up.

Wheelabrator Adds Wet Dust Collector

Wheelabrator Corp., manufacturers of bag type dust collectors and airless blast cleaning equipment, has added another product to its line.

This latest development is the Wheelabrator Wet Dust Collector which, after extensive testing, is claimed to show an excellent efficiency performance. It has outstanding features, including no moving parts, no nozzles or pumps and delivers discharge air free of entrained water.

Write them at 1081 S. Byrkit St., Mishawaka, Indiana for free copy of operating fact sheet.

Apply Law of Diminishing Returns

An Arkansas extension bulletin suggests farmers apply the law of diminishing returns to fertilizer application. Thus each jump in fertilizer-per-acre pays its way, including the cost of application, in increased yield—the jump is justified. But when the yield increase fails to justify the increased expense, it is time to level off. This is, of course, a reverse twist on the usual "use enough fertilizer" advice . . . and sounds to us like a sound approach to conservative farmers, as who isn't.

Poor Cotton Endangers Market

National Cotton Council warns that a shortage of good cotton is likely to encourage rayon production at home and abroad, and once these markets are lost, they will be difficult to regain. Hence the Council is pressing for legislation that will help the situation.

Peat Shortage Looms in Germany

We feel sure Americans will learn with real distress that the peat bogs of Germany will supply us for only 60 years longer.

A Renneburg Continuous Combination Ammoniator-Granulator, a Renneburg DehydrO-Mat Dryer with special refractoryless gas-fired furnace, and a Renneburg Straight Shell Cooler . . . being installed in a 30-ton-per-hour granular plant of one of the leading mid-western fertilizer producers.

RENNEBURG CONTINUOUS COMBINATION AMMONIATOR-GRANULATOR

This rugged and highly-versatile unit is being used for government research work and experimentation in plant size quantities.

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CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	February		January		Oct.-Dec. Qtr.		January-June		July-December		YEAR (July-June)	
	1958	1957	1957	1956	1957	1956	1957	1956	1957	1956	1956-57	1955-56
Alabama	.....	74,943[1]	14,989	20,141	96,045	101,280	808,900	872,550	172,721	174,623	983,607	1,042,416
Arkansas	.....	33,045[1]	8,456	13,169	17,829	26,759	265,265	299,172	62,752	59,915	325,150	359,471
Georgia	36,031	47,427	34,593	33,574	169,097	168,751	980,824	988,454	269,529	253,559	1,234,383	1,244,422
Kentucky	.....	43,070[1]	58,756	53,927	47,868	52,013	451,083	441,481	88,771	90,284	541,367	529,600
Louisiana	.....	26,266[1]	6,779	10,761	32,419	46,979	200,277	217,343	64,192	71,129	271,405	273,688
Missouri	.....	50,189[1]	15,042	27,720	142,402	154,331	460,487	444,230	335,312	331,343	791,830	800,471
N. Carolina	.....	145,662[1]	66,664	74,933	131,758	148,970	1,300,353	1,324,267	199,446	216,234	1,516,587	1,649,449
Oklahoma	6,147	8,877	4,110	3,683	21,604	29,343	52,836	65,854	51,436	54,509	107,345	135,396
S. Carolina	55,527	120,593	25,022	39,286	68,388	79,910	694,571	743,670	116,874	122,929	817,500	863,617
Tennessee	12,981	12,332	5,053	6,492	66,286	82,976	383,457	378,626	135,717	141,181	549,253	532,886
Texas	45,897	70,497	24,498	34,255	104,693	130,969	392,770	372,695	213,801	202,406	595,176	566,399
California	(reports compiled quarterly)				225,490	231,361	663,484	639,377	.....	412,747[1]	1,079,748	1,001,554
Virginia	(reports compiled quarterly)				66,405	78,509	600,158	599,111	140,784	154,075	754,223	761,820
Indiana	(reports compiled semi-annually)						781,268	807,981	284,959	305,917	1,087,185	1,063,049
Iowa	(reports compiled semi-annually)						.....	315,329[1]	.....	85,147[1]	.....	445,329[1]
Michigan	(reports compiled semi-annually)						.....	443,908[1]	.....	184,763[1]	.....	*
New Hampshire	(reports compiled semi-annually)						15,730	13,168	3,936	3,253	18,983[1]	*
Washington	(reports compiled semi-annually)								.....	55,709[1]	.....	76,660[1]
Oregon	(report issued annually)								.....	62,147[1]	.....	*
TOTAL	156,583	259,726	263,962	317,933	1,190,275	1,332,151	8,051,463	8,207,979	2,140,260	2,181,357	10,654,760	10,824,238

.....(not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: The market on organic fertilizer materials has been extremely active during recent weeks. Some of these organics are suitable for feed and demand has been heavy resulting in advance of prices. Most producers of leather nitrogenous tankage are sold out for the next 2 or 3 months. One major producer early in March indicated prices of $3.00 per unit of ammonia for June through August shipment, $3.25 September - December, and $3.50 January/forward. These prices were withdrawn about the middle of the month due to uncertainty regarding future supplies of raw material.

SEWAGE SLUDGE: No change in price has been indicated for spot and nearby shipment of a midwestern material, and a southwestern production continues unchanged in price. Supplies appear to be quite adequate.

CASTOR POMACE: Supply position continues adequate for domestic material currently offered at $37.50 per ton in bags, f.o.b. northeastern production point. Imported castor pomace ranges from $38.00 per ton to $5.00 per unit of ammonia, f.o.b. cars at certain southeastern ports.

DRIED BLOOD: Market on this product has advanced sharply in recent weeks with prices ranging for unground sacked blood from $8.00 to $10.00 per unit of ammonia at Chicago. The New York market is somewhat lower.

POTASH: With the movement of potash from new mines in Canada and the import of German material, domestic producers have been curtailing production. Prices, however, continue steady and movement in good volume as the season progresses.

GROUND COTTON BUR ASH: Market on this material continues in good balance with prices firm for this special form of potash, primarily in the form of carbonate of potash. Delivered cost per unit K_2O for most areas compares favorably with domestic sulphate of potash.

SUPERPHOSPHATE: Movement of triple superphosphate currently is in good volume, which is also true of normal superphosphate. Prices continue firm and unchanged.

AMMONIUM NITRATE LIMESTONE: Prices continue unchanged at $49.75 per ton in bags and $45.75 in bulk, f.o.b. cars or trucks at a middle Atlantic production point, and at south Atlantic and Gulf ports. Movement in the southeast is at peak levels.

AMMONIUM NITRATE: Prices continue steady and unchanged at previously announced levels, and in the southeast movement is in heavy seasonal volume.

GENERAL: Better weather conditions particularly in the southeast have sparked movement of mixed fertilizers and direct application forms of nitrogen. The effect of the scil bank in the southeast is expected to reduce the season's volume of business. Some contracting is being done already for the new season on some organic ammoniates which are expected to be in reduced supply for the new season.

INDUSTRY CALENDAR

Date	Organization	Place	City
June 12	Fert. Safety Exec. Comm.	Hotel Roanoke	Roanoke, Va.
June 15-18	Nat'l Plant Food Inst.	The Greenbrier	White Sulphur
July 8-10	Pac. N.W. Fert. Conf.		Pocatello, Idaho
July 18-19	S.W. Fert. Conf.	Buccaneer Hotel	Galveston, Texas
Aug. 20-24	Canadian Fert. Assn.	Manoir Richelieu	Murray Bay
Oct. 22-24	Pacific N.W. Annual		Gearhart, Ore.
Nov. 9-11	Calif. Fert. Assn.	Ambassador Hotel	Los Angeles, Cal.

Safety MEETING AT MEMPHIS OFFERED EXCELLENT PAPERS

Those who failed to attend the seventh annual Fertilizer Section meeting of the Southern Safety Conference missed a program of exceptional excellence—as the following extracts will suggest. The conference was held in Memphis, Tenn., March 3-4.

The new officers elected for the 1959 season are: W. D. Smith, chairman, Southern States Cooperative, Richmond; M. J. Hattier, vice-chairman, Southern Cotton Oil, New Orleans; W. A. Stone, secretary, Wilson and Toomer Fertilizer, Jacksonville.

The Fertilizer Section is now busily working to let all who should be interested know what is coming up for the big annual Section meeting, which is held in Chicago in October, in conjunction with the annual meeting of the National Safety Council.

Selling Safety

by S. R. White, *Spencer Chemical*

Somebody said—"Nothing ever happens until someone sells something." That's logical whether it applies to selling safety or selling fertilizer. Each of you are old enough to have learned that what may seem perfectly logical to you often makes no sense at all to your wife, your boss or your fellow employees. On the other hand, what may seem logical to your wife, your boss or your fellow employees may make little sense to you. Unfortunately, it doesn't make a bit of difference how right you may be and how wrong the other person, if you are selling a product or an idea, it's the other person's thoughts or attitude that tells the story. We deal with these things called people and it's very interesting.

A fellow was playing the pipe organ, and before each number he would run up in front of the organ and say, "Now I am going to play—", and he would announce his number. Then he would run back to the organ and play the song. About the end of the third number there was no more sound coming out of it, and he was hitting empty keys. There was a little kid supposed to be pumping on this thing, and when the organist looked over at him he was just leaning against the pump. He said, "Boy, what's the matter with you?" The boy said, "Mister, if you want me to pump some more, you say 'WE.'" That is the kind of a world it is—the kid that pumps it, the fellow who makes it, the guy who wrote the music and the guy who sold it. You or I are no good alone. It's our attitude and the time, effort and skill devoted to changing the attitude of others that tell the story of success or failure.

How do we go about changing the attitude of others? A while ago I mentioned wives, bosses and subordinates. I'm not going to spend any time on changing a wife's attitude. Their attitude changes by the hour.

The business of changing attitudes is often a matter of timing. If a worker is observed violating a safety rule and you caution him, he is found violating the same rule, bring it up again in a friendly way. Let me give you an example of how important timing and persistance is in most matters. Bob Tatum, who lives across the street from me, has been married six years and has five fine children. Bill Appleman lives right next door, has been married 11 years and has no children—

Now let's take bosses—that's a sorry lot—I can say that because there are two or three guys in our company who call me boss—generally in a tone of voice which clearly indicates they don't believe it. Bosses are necessary I suppose; anyway, all of us are stuck with from one to a half dozen or more and we have to deal with them. I'm assuming here that at times each of you here have to sell one or more of your bosses on an idea, possibly involving an expenditure of funds to promote safety in your plant. How do you go about selling a boss on an idea? Sometimes it ain't easy, I'll admit that, but it helps if you'll keep in mind that bosses generally have a one track mind — No, I shouldn't say that—generally their mind is most often on a certain track. The main track leads to either making more money or saving money and if you have any good ideas, they are sound and logical, and you can prove it without doubt, your boss will accept and support any such ideas. He'll think you are a great guy and you'll think he's great and you'll live happily ever after **if** you just keep up the good work of presenting money making or saving ideas.

Ideas must be well thought out and presented at the right time if they are to be accepted. There was a kid back home who, unless he changed his ways sure wouldn't get far in selling his boss. He lived in Stoutland; the Frisco RR runs uphill from that point on to Richland. Back at Lebanon the freights have a down hill run for four or five miles then they start up the long mountain. One evening just after dark this kid, about 19, flagged down a long freight north of Stoutland. The engineer jumped down, ran up in front and said "Boy, what's the matter, is the bridge out over Turkey creek?" The kid said, "Well I don't know, but I wondered if you'd like to buy a coon." The engineer said, "Let me get this straight—You flagged this train down to ask me if I want to buy a coon—don't you know I'll have to back up all the way to Lebanon to get another run at this mountain—You dim-wit—you numbskull—You —You—." The kid said, "Well now you don't need to get so excited. I haven't even caught him yet."

Others in the group we deal with in selling safety or fertilizer are co-

workers and employees under our supervision. Again our attitude toward these people and their attitude toward you or me has a most important effect upon the accomplishment of the things we are most anxious to accomplish.

There is much wisdom in not trying to go it alone. In order to get cooperation we first have to give. Give before you get is a cardinal rule, and the degree of success of almost any program or endeavor may well be in direct relation to how well we keep that rule in mind and practice it. I have a little boy in my block who comes calling on us every once in a while. He is the questiongest kid I ever saw. We hate him. We never know the answers to his questions. We told him one day that we knew a little boy like him who always asked questions, and when he grew up he turned into a question mark. He said, "How did he keep the dot underneath him?" That is a sample of how this kid operates.

I have a smart wife. She would do well in business. Now when Jimmy comes over to the house she says, "Jimmy, I have a package of cookies wrapped up for you to take home with you."

That does it. It is never over a minute before Jimmy comes in with his hat and says "Give my cookies to me and I'll see you all tomorrow." She knows you have to give before you get. He is not going home just because you would like it, any more than your co-workers are going to cooperate with you just because that's what you'd like. It has to do something for them. Give before you get.

Now it's remotely possible that you may follow the suggestions I have given you, in good faith, and fail. If that should happen, I can accept no responsibility—it'll be due to Gumperson's law which, simply stated, is "The contradictory of a welcome probability will assert itself whenever such an eventuality is likely to be most frustrating." This law, for example, accounts for the fact that you can throw a burnt match out the window of your car and start a forest fire while you can use two boxes of matches and whole edition of the Sunday paper without being able to start a fire under the dry logs in your fireplace.

God bless you for all the good things you are doing to make this a better world. I hope every one of your children have healthy and wealthy parents. If we should meet again on the highway of life, remember the immortal words of Henry Ford, EUGAH, EUGAH!"

Management Responsibility

by Paul T. Truitt, *National Plant Food Institute*

Let us begin by admitting that, first, safety pays! In all humane values—in dollars and cents. Employees everywhere, even in the fertilizer industry, want to work under good conditions in safe mines and plants.

Admitting these points, we may ask ourselves why the achievement of a full safety program for fertilizers is moved forward quite slowly and then only with effort. Safety should keep pace with advance in technology and in product. Surely, a one-hundred-per-cent effective safety program is a required part of the dynamic economy which carries us along today.

The very first step in building a better safety program is for fertilizer management to first win the mind of each employee from the lowest worker to the highest executive; and, next, to make each mind conscious of how to work safely. Knowledge of how to work safely on the job can be taught or it can be put before the employee, but the lesson will not be learned and become a part of the employee's mind and daily thinking unles he first has developed the right attitude towards safety. Someone has aptly said: "Safe habits and attitudes are more often caught than taught."

Management must decide in the beginning that it is going all out for safety. In this industry, there is unfortunately abundant need and opportunity for improvement. I want to make clear the Institute's attitude towards safety. We are for it. We are convinced it is best accomplished through our own Fertilizer Section in the National Safety Council and through our own executive committee of 36 each of whom serves a 3-year term.

The recommendation I would make today to each fertilizer manu-

it's... magnesia for greater yields
Year after year Berkshire's EMJEO* (80-82% Magnesium Sulphate) and Calcined Brucite (fertilizer grade) 65% MgO have proved to be invaluable primary plant foods—together with nitrogen, phosphorous, and potash.
it's... BERKSHIRE for highest quality magnesia
Be sure to include Berkshire's EMJEO and/or Calcined Brucite (fertilizer grade) 65% MgO in your mixtures as sources of available magnesium. You'll be glad you did.
and
it's... BERKSHIRE'S POTNIT*
(94/95% Nitrate of Potash) for special mixtures and soluble fertilizers.
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facturer who is not already a member is to join the National Safety Council and cooperate in the work of its Fertilizer Section, and to do it now.

In looking at management's role in safety, **all agree** that the first responsibility for an effective safety program rests squarely upon the top executive or governing group in any organization. Certainly, it cannot be placed elsewhere. The selling and the support for the program must come from the top. The management team must be inclusive from top to bottom: owners, managers, and employees alike. Surely not even one person can say: "Safety is not my responsibility."

Passive interest only will not produce results. Active interest is essential—the kind that gets things done is what counts. Top management men necessarily must pass responsibility on to subordinates, establishing, from the top down, the right attitude towards safety, the right plan of action, and adequate machinery to carry out the plan.

And, management may rest secure in the knowledge that a safety program, soundly planned and administered, will stand up on its own merits.

Hanau Talk Dramatic

W. L. Hanau of the Fidelity Casualty Co. made a pithy, pointed talk at the Fertilizer Section meeting. His subject was essentially a dry one, but he made it otherwise. It was "Hazards and necessity safeguards for entering unfired pressure vessels."

It seems obvious that men entering such vessels should take the precaution of not going in without someone standing by, but as Mr. Hanau says every fire and police department knows of many times when a man enters such a vessel, and some time later someone casually looks inside to find him overcome because of oxygen deficiency or a toxic situation.

There are other reasons, such as slipping, falling, striking against something, struck by something, burns . . . all pretty gruesome; all to be guarded against by the use of sensible precautions.

As he says, the vessels themselves are designed with a 4 or 5 safety factor. Surely we should give ourselves and our people the same margin.

Some of these safety-factor items include the proper coveralls, with hood; stout gloves, preferably of leather to guard against bruises and abrasions. When a hammer is to be used to sound out plate or remove scale or corrosion, deep eye-cup goggles are excellent, and the more recent all-plastic goggles that are well ventilated have proven satisfactory.

Hard hats as protection against falling objects, are obvious. Rubber boots or rubbers are a must when the bottom of the vessel still holds liquid, especially acids or corrosive substances.

These samples may indicate how vital it can be for your safety man to secure a complete transcript of this talk, make its contents known to those who do this type of work.

AAC Announces Safety Records

American Agricultural Chemical Co. has announced perfect safety records at 11 of its plants. The plant at Spartanburg, S. C. has had no lost time injuries for five years; Henderson, N. C., four years; Cleveland, Ohio, Columbia, S. C., and Norfolk, Va., two years; Alexandria, Va., Baltimore, Md., Cincinnati, Ohio; Greensboro, N. C., Pensacola, Fla., and Montgomery, Ala., one year.

Five Minute Safety Talks

The National Safety Council has two new publications available for industry — one for employees, the other for foremen.

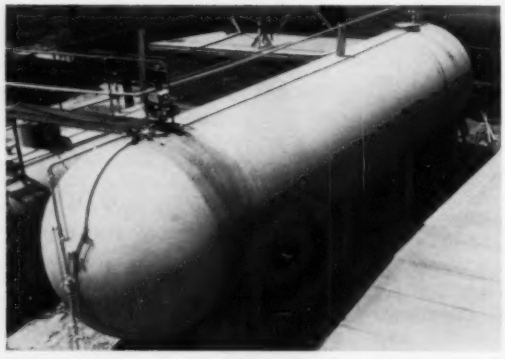
The publications, "Rules for Safety" and Book 8 in a series of "Five Minute Safety Talks for Foremen," are designed to promote safety in industry.

"Rules for Safety," the Council says, is the "biggest and best safety rules booklet ever compiled — 40 pages covering accident prevention do's and don'ts, how's and why's." The booklet gives safety rules for using power tools, stacking material and lifting and carrying.

The book of safety talks for foremen is a compilation of talks that appeared in earlier books in the series. The 52 talks in Book 8, the Council says, "provide full and balanced coverage of all the major types of occupational accidents."

Talks in Book 8 range from "Why We Have a Safety Program" to "Bumping into People and Things."

Free copies of descriptive brochures on the literature are available from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.



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1957 Potash Deliveries Show Slight Increase

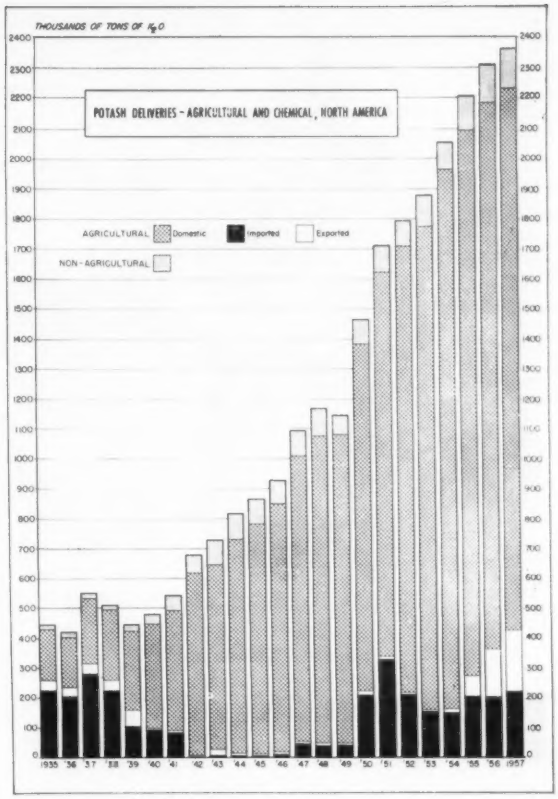
Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, Puerto Rico, and Hawaii by the eight principal American producers and also the importers totaled 3,461,578 tons of salts containing an equivalent of 2,026,239 tons K_2O during 1957, according to the American Potash Institute. This was an increase of less than 1% in salts and K_2O over the same period in 1956. Continental United States took 1,867,732 tons K_2O; Canada, 92,147 tons; Cuba, 18,059 tons; Puerto Rico, 21,899 tons; and Hawaii, 26,402 tons K_2O. These figures include imports from Europe of 219,903 tons K_2O. Exports to other countries were 205,168 tons K_2O, an increase of 28%. Deliveries of potash for non-agricultural purposes amounted to 129,517 tons K_2O, an increase of 1% over last year.

In the United States, agricultural potash was delivered in 46 states and the District of Columbia. Illinois with nearly 200,000 tons K_2O was the leading state followed in order by Ohio, Indiana, Georgia, Florida, and Virginia, each taking more than 100,000 tons K_2O during the year. Due to shipments across state lines, consumption does not necessarily correspond to deliveries within a state.

Agricultural potash accounted for nearly 95% of deliveries. Muriate of potash continued to be by far the most popular material, comprising over 93% of the total K_2O delivered for agricultural purposes, with sulphate of potash and sulphate of potash magnesia accounting for 7%.

Deliveries for non-agricultural purposes in 1957 were 194,171 tons of muriate of potash containing an equivalent of 122,002 tons K_2O, 9,998 tons of sulphate of potash containing 5,044 tons K_2O, and 10,591 tons of manure salts containing 2,471 tons K_2O. The total non-agricultural deliveries of 129,517 tons K_2O were about 5% of all potash deliveries, and 1,531 tons or 1% more than in 1956.

During the fourth quarter of 1957, deliveries for agricultural purposes were 441,307 tons K_2O in continental United States, 42,631 tons in Canada, 7,875 tons in Cuba, 7,298 tons in Puerto Rico, and 6,687 tons in Hawaii making a total of 505,798 tons K_2O, a decrease of 13% under last year. These figures include imports from Europe during June through December. Exports of potash to other countries during the fourth quarter were 24,084 tons K_2O, a decrease of 28,662 tons or 55% under last year. Deliveries of potash for non-agricultural purposes were 34,609 tons K_2O, an increase of 10% over last year.



In addition to the regularly reported deliveries on the quarterly basis, information from governmental and other sources indicates that during June through December of 1957, there were imports of European potash into the United States, Canada, Cuba, and Puerto Rico of 116,907 tons K_2O as muriate of potash and 33,024 tons K_2O as sulphate of potash. These figures are included in the deliveries for the fourth quarter.

West Va. Absorbs Fulton Bag & Products

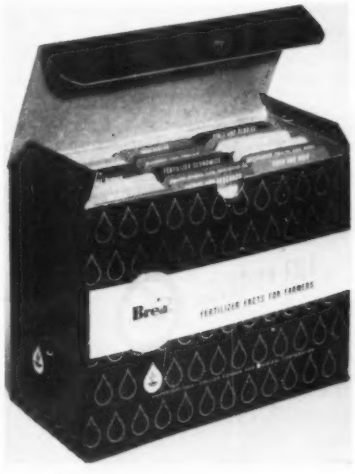
Fulton Bag and Products Company of New Orleans, La., has been absorbed through a cash transaction as a division of West Virginia Pulp and Paper Company.

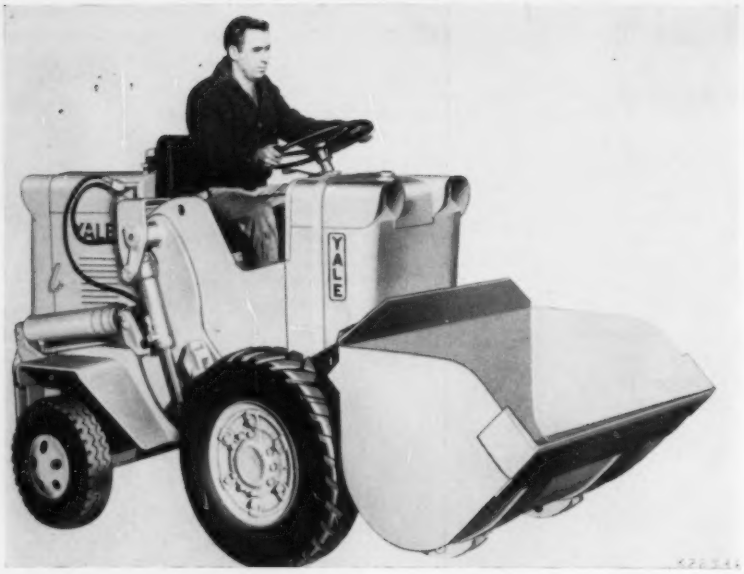
Fulton Bag and Products Company operates plants at New Orleans and St. Louis, and district sales offices in New York, Chicago, Minneapolis, Denver, Kansas City, Dallas and Atlanta.

The present management of Fulton Bag and Products, headed by Jason M. Elsas, president, will continue to direct its operations. No changes are contemplated in the operating or sales organization of the company, which has been engaged in the bag business in New Orleans and St. Louis since the turn of the century.

West Virginia Pulp and Paper Company is a pioneer in the manufacture of kraft paper, having begun production of these grades in 1924, is now manufacturing Kraftsman Clupak stretchable paper which the company recently introduced to the market.

A digest of fertilizer facts that took five years to compile has been made available to Western growers by the Collier Carbon and Chemical Corporation, manufacturers of Brea Brand fertilizer products. The new information source is called a "Solution File" by the company, and includes case history answers to questions such as how, when, what spacing and what depth to apply fertilizer solutions. Information is filed according to crop and area. "Solution Files" are being distributed through Brea Brand dealers.





Yale Materials Handling Division has entered the bulk materials handling field with this Y-18 Industrial Tractor Shovel designed to produce 25 per cent more work than existing units.

Yale Tractor Shovel Claims Boost Of 25% In Capacity

Development of a new industrial tractor shovel with a 25 per cent greater work capacity than units presently available has been announced by Yale Materials Handling Division, The Yale & Towne Manufacturing Company.

Designated the Y-18, the new units will be formally introduced through Yale branches and representatives throughout the United States and Canada during May.

Introduction of the industrial tractor shovel marks the entry into the field of bulk materials handling by Yale, builder of a complete line of industrial lift trucks and hand and electric hoists.

The new unit will be produced initially in the division's main plant in Philadelphia; other Yale Materials Handling Division plants are located in San Leandro, Calif. and Forrest City, Ark.

Five factors are cited as contributing to the greater work capacity of the Y-18: **1.** A 2500 pound carry capacity, 500 pounds greater than similar units on the market. **2.** Full six foot high dumping clearance, one foot higher than existing models. **3.** Fully automatic torque transmission which eliminates clutch pedal and manual gear changing—speeds operation. **4.** Rapid acceleration, 0 to 8 miles per hour in 3½ seconds, and a top speed of 13 miles per hour, fastest available. **5.** Forty-five degree bucket tip-back at ground level carrying position.

Yale's Y-18 is being introduced with a range of bucket capacities from 10 to 27 cubic feet. It will be distributed through the same factory sales and service branches and franchise representatives who presently handle the Yale lines of industrial lift trucks.

Arms of the new tractor shovel are engineered with a safety-curve design to provide the operator with more room and protection from possible injury. Even at the high dumping level, the bucket arms do not rise above the side panels of the operator cockpit, eliminating the danger of clothing or elbows being caught on the downward stroke, and giving more cockpit operating room.

Loader arm linkage of the Y-18 automatically returns the bucket to a loading position on its downward swing, speeding cyclic rate of operation by removing an operator function.

Power source is a 6-cylinder Model 30 Chrysler industrial engine rated 66 horsepower at 2000 RPM, and available for use with both gasoline and LP-gas fuel.

The Y-18 is only 117 inches long with the bucket in the tip-back position. Stability is further improved by a virtually 50-50 weight distribution on the drive and steering axles and articulation of up to four inches on the steering axle. There is only a 1⅛ inch difference in the front and rear wheel tread as a further stability aid.

It is stated to be the only unit of its type designed with sealed hydraulic brakes to prevent brake failure from the introduction of loose, powdered materials so often found in areas where tractor shovels work. The hydraulic system is sealed to keep out foreign material. Dual air cleaners shield the carburetion system, and the generator and distributor are also sealed against dusty operating conditions. As an aid to servicing the unit, the transmission pump is mounted in line with the generator in an easily accessible position. The pump drives off the generator shaft affording a safety factor by stopping the unit in case of fan belt failure.

Because of its four-foot wheel base and short overall length, the Y-18 has a turning radius of only 6 feet, 7 inches, calculated from the outside of the rear corner of the formed, protective counterweight casting. All steering linkage is mounted above the cast steel axle protecting it from damage and giving the unit a high, seven and one-half inch underclearance.

An additional operating advantage through the use of 7:50x15 tires on the drive wheels. This size permits a wide selection of tread and ply designs to suit individual conditions. Steering wheel tire size is 6:00x9.

In addition to the increased space provided by the safety curve arms, the whole operator compartment is designed to provide maximum leg, arm and hip room. The operator seat is adjustable—three inches forward and backward. Directional controls are conveniently positioned just below the steering wheel for finger-tip control. The level can be placed on either the left or right side of the steering column. Arm and bucket controls are located just to the left of an adjustable operator seat for easy accessibility.

Vincent Sauchelli says:

Agriculture Needs Many Recruits

Job opportunities in agriculture continue to offer tempting rewards to young men and women. The demand in almost every section of the country for college graduates in agriculture exceeds the supply. At the same time, it is true that farm population is decreasing and the need for young folks on the farm is also decreasing. The related agricultural industries have been increasing and expanding rapidly. It is this "agribusiness" sector of the giant agricultural industry that offers unlimited opportunities to qualified persons.

According to recent surveys of the American Association of Land-Grant Colleges and State Universities, every segment of agribusiness has attractive positions to be filled by properly trained persons. These colleges and universities expected to supply 8,500 graduates in 1957, but the openings are for 15,000. Available positions exist for 1,000 graduates in agricultural research, 1,500 in farm services and vocational agricultural teaching, 1,000 in various conservation services, 3,000 in industry, business and education. Men are needed to inspect, grade and market farm products. The demand for trained people to sell fertilizers, feed and agricultural chemicals is especially heavy.

It is part of the responsibility of the fertilizer industry as well as the other segments of agribusiness to arouse interest in their organizations among high school students. Other industries are carrying out intensive advertising campaigns and ambitious recruiting programs among high schools, colleges and universities to attract young graduates. Careers in agribusiness, the giant among industry, should be better known among the student world and the parents of such prospects. Altogether too many desirable young people are being drawn away from healthy, satisfying careers in agribusiness because they have not been sufficiently informed of such opportunities.

Forest Fertilization In Germany

In modern Germany forestry fertilising now becomes a rather common means of getting better soil conditions.

Liming is already used on a large scale as a means of increasing biological activity in bad humus types. It is preferable to lime growing stands: the trees will use the mobilized plant nutrients.

It is entirely wrong to say that forest fertilising is unnecessary, believing that the soil profile — even when the ground rocks are poor — will be enough enriched in plant nutrients by the activity of the roots and the falling leaves and so forth.

Uncertain results of many old fertilising trials are easily explained by deficient plans and experimental technique. Despite these errors several old trials show positive effects when revised now.

In order to get results of fertilising we need more knowledge about soil fertility at different places, i.e. how much above or below optimal conditions are different nutrients. As yet we are not able to make entirely reliable diagnoses; we know, however, some limiting values. When results from our new trials become available we will get much better possibilities of fertilising in a proper way.

(Dr. W. Wittich, Institut fur Bodenkunde, Hann, Munden, in "Plant Nutrition News.")

Stedman Publishes Two New Bulletins

Two publications of special interest to the fertilizer industry have recently been published by Stedman Foundry and Machine Co., Aurora, Indiana and are available free to those interested in the equipment discussed:

Catalog 515 covers the broad field of machinery specifically designed for use by our industry—batch mixers, ammoniators, granulators etc. Each major piece of equipment is carefully illustrated both in photographs and in blue-prints, and fully described by specifications. This is a 24-page document. Bulletin 516 discusses Stedman equipment for crushing, pulverizing, disintegrating, mixing, screening, castings . . . and complete granular processing plants.

Copies are available direct from the home office, or from the 11 sales offices.

OBITUARIES

Edward Guy Cole, 77, president R. D. Cole Mfg. Co., Newnan, Ga., March 11.

Dr. Thomas P. Cooper, 76, retired Dean of the University of Kentucky's College of Agriculture and Home Economics, February 19.

Edward A. O'Neal III, 82, for more than 20 years president of the American Farm Bureau Federation, February 26.

Oliver M. Smith, 57, manager Bemis Bro. Bag Co., Minneapolis sales division, suddenly, February 25.

John B. Whitney, 76, retired specialist in sulphuric acid plant design and operation, died March 10 in a Montclair, N. J. hospital after a long illness.

T. Leland Wilkerson, 59, general salesmanager American Cyanamid phosphates and nitrogen division, suddenly at his Greenwich, Conn. home, March 10.

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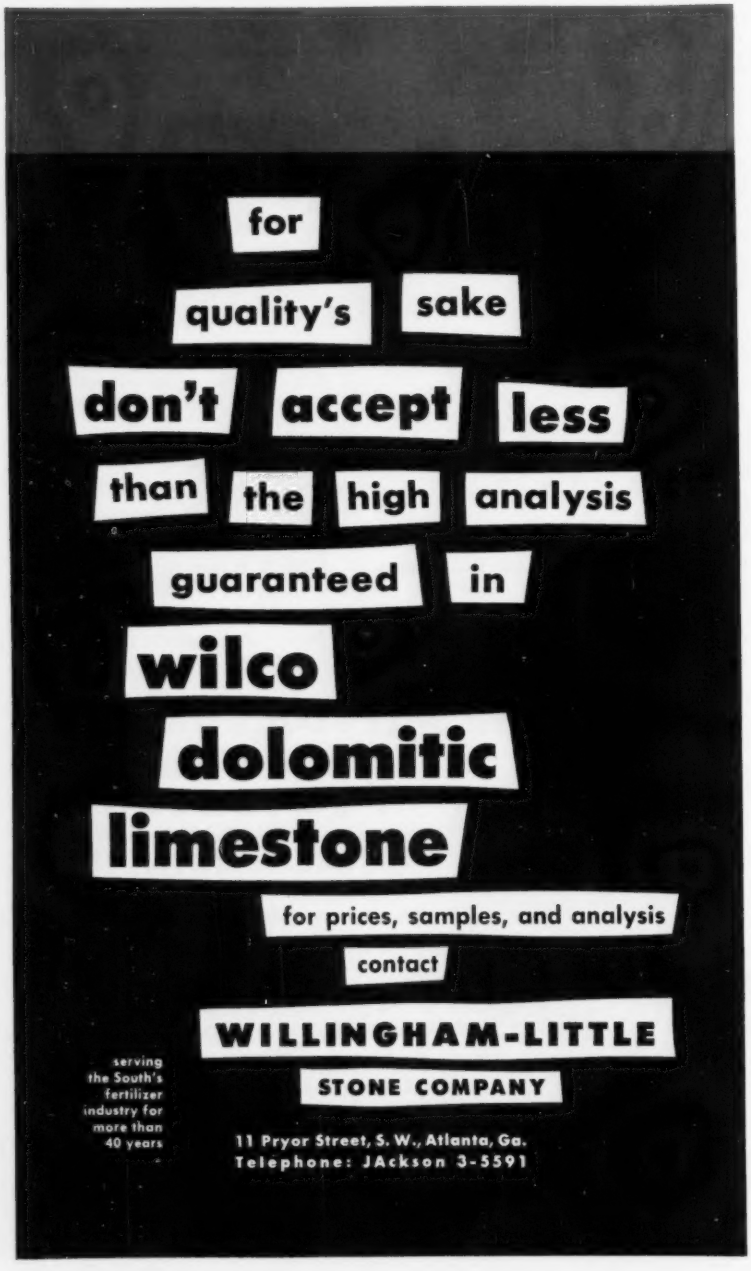
Soil Society to Publish 'Methods of Soil Analysis'

The Soil Science Society of America has assumed responsibility for the publication of methods of soil analysis. This will replace the chapter on soils in "Official Methods of Analysis" published by the Association of Official Agricultural Chemists. The AOAC will discontinue this chapter in their publication. The change was approved by both organizations at their 1957 annual meetings. Attainment of uniformity and accuracy in methods of soil analysis became an objective of AOAC in 1886.

The new SSSA publication will cover the physical measurements, chemistry, mineralogy, and microbiology of soils. Selecting and editing the methods for each field will be handled by the appropriate committees of the Society, with the committee chairmen serving as the editorial board. Soil scientists most competent in the subdivisions of each field will be appointed to the committees. The number of procedures selected for any analysis or measurement will be based on the need for and usefulness of the methods. None of them will be designated as "standard" or "official" procedures.

The methods probably will be first published in a loose-leaf, lithographed or mimeographed form, and each section for a particular field will be published as soon as it is prepared within the coming three years. Revisions and additions will be made periodically, and after an ample period of use, study, and revision, the procedures will be published in printed and bound form.

SSSA points out that much of the information on soil analysis now is widely scattered. A well-prepared volume concerned solely with this subject should encourage additional study and result in improved methods and more widespread knowledge and use of the procedures. The SSSA committees will encourage more interlaboratory study of new and established procedures to assist in adding to or revising the proposed book.



Refresher Course Stresses Fertilizer, Lime Use

A refresher short course in general agronomy, with emphasis on use of fertilizer and lime, was held March 17-20 for county agents and assistants at the Georgia Center for Continuing Education, Athens.

More than a hundred were in attendance at the sessions, sponsored jointly by the Extension Service and Georgia Plant Food Educational Society.

Bulletin Describes New Omega Weigher

A new bulletin on the Pneu-Weigh continuous weighing scale has been prepared by the Omega Machine Co., a division of B-I-F Industries, Inc., which lists the advantages of the scale, describes its simple operation and available accessories, and gives complete dimensional drawings.

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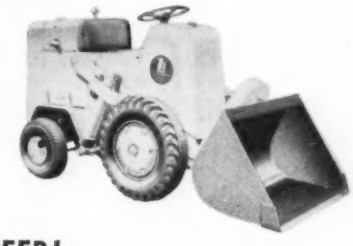

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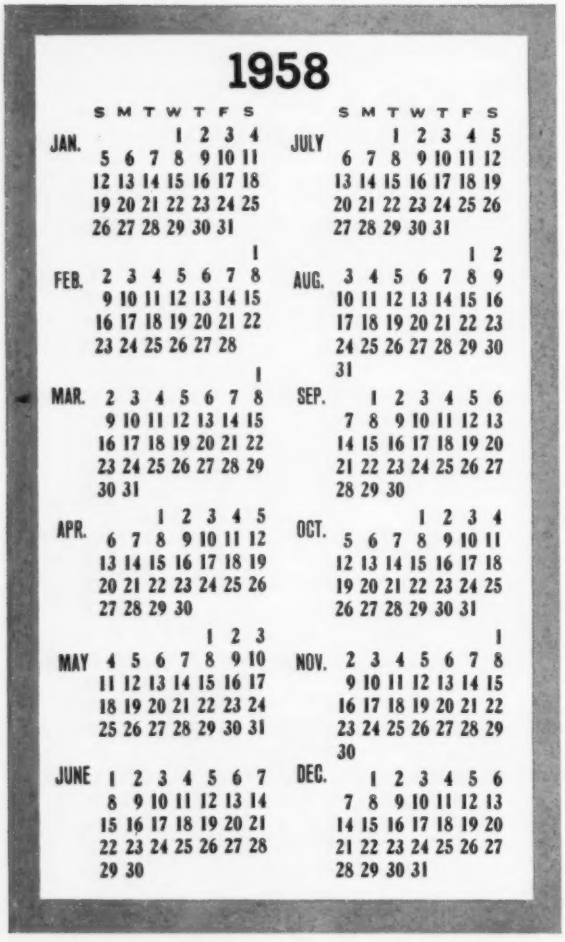

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